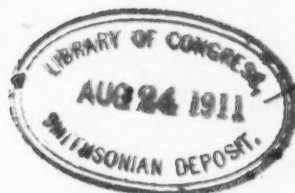


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PROCEEDINGS
OF THE
AMERICAN SOCIETY
OF
CIVIL ENGINEERS

VOL. XXXVII—No. 6



August, 1911

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OF THE
AMERICAN SOCIETY
OF
CIVIL ENGINEERS
(INSTITUTED 1852)

VOL. XXXVII—No. 6
AUGUST, 1911

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The House of the Society is open from 9 A. M. to 10 P. M. every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

HOUSE OF THE SOCIETY—220 WEST FIFTY-SEVENTH STREET, NEW YORK.

TELEPHONE NUMBER.....5913 Columbus.
CABLE ADDRESS....."Ceas, New York."



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AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

SOCIETY AFFAIRS

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MINUTES OF MEETINGS

OF THE SOCIETY

May 17th, 1911.—The meeting was called to order at 8.30 P. M.; E. Kuichling, M. Am. Soc. C. E., in the chair; Chas. Warren Hunt, Secretary; and present, also, 99 members and 10 guests.

A paper by Charles Arthur Hague, M. Am. Soc. C. E., entitled "The Present-Day Pumping Engine for Water-Works," was presented by the author and illustrated with lantern slides. The Secretary presented a written communication on the subject by Charles B. Buerger, Assoc. M. Am. Soc. C. E., and the paper was discussed orally by Messrs. E. Kuichling, J. H. Gregory, G. A. Orrok, Kenneth Allen, and the author.

Adjourned.

W. L. M. 28 [unclear] 12

June 7th, 1911.—The meeting was called to order at 8.30 P. M.; A. L. Bowman, M. Am. Soc. C. E., in the chair; Chas. Warren Hunt, Secretary; and present, also, 123 members and 16 guests.

The minutes of the meetings of April 19th and May 3d, 1911, were approved as printed in *Proceedings* for May, 1911.

A paper by D. C. Henny, M. Am. Soc. C. E., entitled "Two Earth Dams of the United States Reclamation Service," was presented by the Secretary, who also read a discussion on the subject by James Dix Schuyler, M. Am. Soc. C. E.

A paper by Wilbur J. Watson, M. Am. Soc. C. E., entitled "Steel Centering Used in the Construction of the Rocky River Bridge, Cleveland, Ohio," was presented by the Secretary.

The Secretary announced the election of the following candidates on June 6th, 1911:

AS MEMBERS

THEODORE HASTINGS BACON, Armstead, Mont.
HUGH CUNNINGHAM BANKS, San Francisco, Cal.
MAXWELL CUNNINGHAM BYERS, Springfield, Mo.
ABRAHAM LINCOLN FELLOWS, Denver, Colo.
HENRY FLOY, New York City.
CHARLES RICHARD HEDKE, Fort Collins, Colo.
HENRY CLARENCE HODGKINS, Syracuse, N. Y.
BEN JOHNSON, Gatun, Canal Zone, Panama.
HOWARD LOTHROP, Fall River, Mass.
JAMES CORNELIUS MURPHY, Louisville, Ky.
WALTER RALEIGH OKESON, New York City.
ROBERT WINTHROP PRATT, Columbus, Ohio.
CESAR DE SÁ RABELLO, Rio de Janeiro, Brazil.
EDGAR FRANKLIN ROBINSON, Rochester, N. Y.
HARRY ASAHIEL STORRS, Denver, Colo.
HIRAM EVERETT TERRY, Flint, Mich.
WILLIAM LOVE THOMPSON, Corozal, Canal Zone, Panama.
BENJAMIN ELLSWORTH TILTON, Rochester, N. Y.
FRANCIS JOHN TRESISE, Buffalo, N. Y.
GEORGE ALPHA WINSOR, Valhalla, N. Y.
GEORGE PILLSBURY WOOD, Peekskill, N. Y.

AS ASSOCIATE MEMBERS

CHARLES ROLLIN ALLEN, Jr., Mechanicville, N. Y.
FRANK LAFAYETTE ANDERS, Fargo, N. Dak.
FRANK FOY AXTELL, Port Arthur, Tex.
FREDERICK LOUIS BIXBY, Agricultural College, N. Mex.
ARTHUR MAXIMILLIEN BOUILLON, St. John, N. B., Canada.
CHAUNCEY ALLISON BURNETTE, Seattle, Wash.

ELIAS CAHN, New York City.
HARTLEY ROBERT CHURCH, Berkeley, Cal.
FRED WINSLOW CLAFLIN, Holsopple, Pa.
THOMAS EDWARD COLLINS, Pottsville, Pa.
JAMES ROGER CROCKER, New York City.
HAROLD JAMES DOOLITTLE, North Yakima, Wash.
RALPH SELDEN EDMONDSON, High Falls, N. Y.
FRANCISCO JOSÉ GASTON Y ROSELL, Isabela de Sagua, Cuba.
ARTHUR RIPONT KELLER, Honolulu, Hawaii.
GEORGE WALTER KOSS, Des Moines, Iowa.
WILLIAM LOUIS KUEHNLE, New York City.
FREDERICK WASHINGTON LAWSON, Perth, Western Australia.
WALTER POWELL LINTON, Manila, Philippine Islands.
ORO McDERMITH, Newell, S. Dak.
GEORGE MONCUR, Glasgow, Scotland.
CLARE JOSEPH MOODY, Ronan, Mont.
WILLIAM CLYDE MUNDT, Tulsa, Okla.
FRANCIS JOSEPH O'HARA, Wampus, Ore.
DANIEL BERRY PACKARD, Washington, N. C.
CHARLES ALBERT RIGGS, Newport, Ky.
STEPHEN ALLEN ROAKE, Trenton, N. J.
FREDERICK THURSTON ROBSON, San Francisco, Cal.
FREDERICK WILLIAM SCHEIDENHELM, Connellsville, Pa.
WILLIAM HENRY SEAMAN, Glen Cove, N. Y.
CHARLES STEPHEN SHAUGHNESSY, Cold Spring, N. Y.
JOHN EARL SHOEMAKER, Pueblo, Colo.
ALLEN WHITMORE STEPHENS, East Orange, N. J.
VERNON LYLE SULLIVAN, Buenavista, Tex.
LESLIE FLANDERS VAN HAGAN, Madison, Wis.
HARRY ROGERS WICKHAM, Rochester, N. Y.
JAMES HENRY WILLIAMS, Fort Meade, S. Dak.

As Associate

EDWARD COE DILWORTH, Pittsburg, Pa.

As Juniors

PENDLETON BEALL, Poughkeepsie, N. Y.
JAMES BUCKLEY BLACK, St. Louis, Mo.
WILLIAM ARTHUR BURTON, Springfield, Mo.
ANTONIO CASTILLO Y GRAU, Cienfuegos, Cuba.
JOHN JAMES CROTTY, St. Louis, Mo.
MERTON JAMES DOUTHITT, Chicago, Ill.
VIRGIL ALLEN EBERLY, Culebra, Canal Zone, Panama.
EDWARD HALL GILL, Denver, Colo.
HARRY PARKER McKEAN, La Junta, Colo.

ALVIN RUSH MURPHY, New York City.
JAMES ELWOOD PAYNE, New York City.
HENRY BOUTWELL SMITH, Gatun, Canal Zone, Panama.
JOHN HENRY SPENGLER, Troy, N. Y.
WILLIAM TUFTS, Boston, Mass.
ELLIOTT VANDEVANTER, Baltimore, Md.
ARTHUR VOSBURY VANNEMAN, Newburg, W. Va.
CHESTER GORDON WELLS, Pocatello, Idaho.
HENRY BELCHER WHEATCROFT, Jr., New York City.
HOWARD MCCLYMONDS YOST, Massillon, Ohio.
OLIVER EARLE YOUNG, Lincoln, Ala.

The Secretary announced the transfer of the following candidates on June 6th, 1911:

FROM ASSOCIATE MEMBER TO MEMBER

CHARLES ENZIAN, Wilkes-Barre, Pa.
CHESTER JAMES HOGUE, Boston, Mass.
WILLIAM AUGUSTUS HOWELL, Newark, N. J.
HOWARD ELMER HYDE, Havana, Cuba.
ELBERT EMERSON LOCHRIDGE, Springfield, Mass.
ROBERT HENRY MCPHERSON, New York City.
GEORGE PILLSBURY MORRILL, Sagua la Grande, Cuba.
HARRY EDWARD WAGNER, Andover, N. J.
WILLIAM DEWITT WALTMAN, San Acacio, Colo.
HERBERT SEDGWICK WILGUS, Angelica, N. Y.

FROM ASSOCIATE TO ASSOCIATE MEMBER

ROBERT HILEMAN LEE, Cleveland Heights, Ohio.

FROM JUNIOR TO ASSOCIATE MEMBER

CHESTER DANIEL ASHBROOK, Chatcolet, Idaho.
ALBERT SERENO BRAINARD, Hartford, Conn.
HOWARD EMORY BUSHNELL, Newark, N. J.
CHARLES GILMAN, Plainfield, N. J.
RALPH WELLER GREENLAW, Cold Spring, N. Y.
RUSSELL EDWIN HARRISON, Grand Rapids, Mich.
CARL HUGO JABELONSKY, Spokane, Wash.
GILBERT GARFIELD JACOBOSKY, Wilkes-Barre, Pa.
WILLIAM JOHN MILLARD, Kanyama, Congo Belge, West Africa.
HENRY SCHELL NICHOL, Victoria, B. C., Canada.
JOSEPH SHEMA, Wheeling, W. Va.
HARRY EDWIN SQUIRE, Bremerton, Wash.
FREDERICK SAMPSON WESTON, Middleboro, Mass.

FROM JUNIOR TO ASSOCIATE

ROBERT BRECK MORAN, San Francisco, Cal.

The Secretary announced the following deaths:

ROSSELL EMMONS BRIGGS, elected Member, September 15th, 1869; died May 4th, 1911.

ALFRED COURTNEY LEWERENZ, elected Junior, March 5th, 1895; Associate Member, June 6th, 1900; and Member, March 6th, 1906; died May 27th, 1911.

CHARLES WIDNEY WOOD, elected Member, October 7th, 1908; died April 3d, 1911.

ALEXANDER ILICH WOLKOWYSKI, elected Junior, January 7th, 1908; died September 27th, 1910.

Adjourned.

FORTY-THIRD ANNUAL CONVENTION

Owing to the fact that the stenographer's report of the Annual Convention was not received in time for preparation for this number of *Proceedings*, the minutes of the meetings, report in full, etc., will be published in a subsequent number.

ELECTIONS AND TRANSFERS BY THE BOARD OF DIRECTION
JUNE 30TH, 1911.

AS MEMBERS

HENRY EMMETT BARTLETT, Chicago, Ill.
WALTER FREEMAN BROOKS, Mankato, Minn.
FRANK FOSTER, Buenos Aires, Argentine Republic.
HENRY WEBSTER HOBBS, Portland, Me.
WILLIAM HAUSMER HOYT, Duluth, Minn.
WILLIAM HENRY HUNT, New York City.
GEORGE CRAIG LEIDY, Steelton, Pa.
SAMUEL OSGOOD MILLER, New York City.
EDWARD STEVENS RANKIN, Newark, N. J.
HENRY GARNETT SHIRLEY, Towson, Md.
EDWIN GEORGE SMITH, Irwin, Pa.
WILLIAM THOMAS WALKER, Chicago, Ill.

AS ASSOCIATE MEMBERS

EDWARD IVAN CLAWITER, Denver, Colo.
REGINALD GEORGE CLIFFORD, Emigrant Gap, Cal.
RICHARD SHERMAN COOKINHAM, Twin Falls, Idaho.
ALEXANDER PATTON CRARY, Corozal, Canal Zone, Panama.
HANS ANDREAS DAAE, Sacramento, Cal.

LOUIS CHRISTIAN WILLIAM DATZ, New Orleans, La.
ERNEST HARTWELL ELDER, North Yakima, Wash.
CHARLES ALVIN EMERSON, Jr., Harrisburg, Pa.
SAMUEL DAVIS FOSTER, Pittsburg, Pa.
THOMAS SLOAN HEWERDINE, Fisher, Ill.
BATTLE HARGROVE KLYCE, Americus, Ga.
GEORGE THOMAS MAWSON, Bombay, India.
FRED KNIGHTS MERRIMAN, Washington, D. C.
GEORGE FREDERICK MILES, New York City.
ARDSHIRE SORAB FRAMROZE MODY, Bombay, India.
GLENN LANE PARKER, Washington, D. C.
JOHN WILSON ROLAND, North Wilbraham, Mass.
CHARLES SAVILLE, Waban, Mass.
THOMAS SHACKELFORD SHEPPERD, Littleton, Colo.
WALTER DORR SMITH, Los Angeles, Cal.
WILLIAM BEAUVAIS SMITH, Jr., New Orleans, La.
FELIX HENRY SPITZER, Kansas City, Mo.
ALBERT FRANKLIN STANFORD, Memphis, Tenn.
HENRY GROSVENOR THROOP, Syracuse, N. Y.
WILLIAM ALBIE VAN DUZER, Kittanning, Pa.
WILLIAM JULIUS WEIGMANN, Schenectady, N. Y.
HANSON ZIMRI WILSON, New York City.
ROBERT BROWN MURPHY WILSON, Empalme, Sonora, Mexico.
FRANK COY WOODWARD, East Pepperell, Mass.

AS JUNIORS

DOUGLAS ANTHONY ALLAIRE, Brooklyn, N. Y.
FREDERICK WEBBER AMADON, New Haven, Conn.
RAYMOND BOOTH, Culebra, Canal Zone, Panama.
ROSS JUDSON BUCK, Manila, Philippine Islands.
FOSTER BALDWIN CROCKER, Rome, N. Y.
WILLIAM AUGUSTINE CUNNINGHAM, Brooklyn, N. Y.
LORENZO JUAN DAVILA, Juana Diaz, Porto Rico.
LEWIS ALDEN ESTES, Detroit, Mich.
WARREN AUSTIN GATES, Oklahoma City, Okla.
GEORGE ELIAS HALSTEAD, New Albany, Ind.
GEORGE EDWARD HERCHKOVITZ, New York City.
WILLIAM HEYMAN, High Falls, N. Y.
LAURITZ RASMUS HJORTH, Seattle, Wash.
FERDINAND NORTHROP MENEFEE, Bend, Ore.
PERCY SHELLEY MONK, Newport, Ky.
STEPHEN EUGENE PAGE, Perth Amboy, N. J.
FLEMING KEEN RICH, Cedar Bluff, Va.
ROY ELMER SMITH, Seattle, Wash.

WILLIAM MATTHEW STIEVE, Cornwall-on-Hudson, N. Y.
 JOHN STROM, Champaign, Ill.
 ARTHUR CUNNINGHAM SWIFT, Red Bank, N. J.

TRANSFERS FROM ASSOCIATE MEMBER TO MEMBER

CHARLES BAKER BURDICK, Chicago, Ill.
 PHILIP BURGESS, Columbus, Ohio.
 RICHARD SANDERS CHEW, San Francisco, Cal.
 WILLIAM HUGH COVERDALE, New York City.
 ELMORE DAVID CUMMINGS, Baltimore, Md.
 CHRISTOPHER COLUMBUS FITZGERALD, Havana, Cuba.
 ERNEST ROTTECK GAYLER, Honolulu, Hawaii.
 THOMAS MONAHAN LAVELLE, Pottsville, Pa.
 HENRY WILLIAM VEHRNKAMP, Cincinnati, Ohio.

TRANSFERS FROM JUNIOR TO ASSOCIATE MEMBER

GEORGE CROWELL ANDREWS, Fulton, N. Y.
 FRANK JOHN FELGENHAUER, Brooklyn, N. Y.
 JOHN NATHANIEL MACKALL, Baltimore, Md.
 WILLIAM ROGERS TYLER, New York City.

OF THE BOARD OF DIRECTION

(Abstract)

June 6th, 1911.—President Endicott in the chair; Chas. Warren Hunt, Secretary, and present, also, Messrs. Belknap, Boller, Clarke, Flad, Kimball, Knap, Loomis, Macdonald, Ridgway, Snow, Strobel, Stuart, and Thompson.

A proposed change in the method of issue of the publications of the Society was presented by the Secretary and referred to the Publication Committee for report.

President Endicott and Messrs. Horace Loomis and Chas. Warren Hunt were appointed a Committee to arrange for the participation by this Society in the 12th International Congress of Navigation in 1912.

Action was taken in regard to members in arrears for dues.

Ballots for membership were canvassed, resulting in the election of 21 Members, 37 Associate Members, 1 Associate, and 20 Juniors, and the transfer of 13 Juniors to the grade of Associate Member, and 1 Junior to the grade of Associate.

Ten Associate Members were transferred to the grade of Member, and 1 Associate was transferred to the grade of Associate Member.

Applications were considered, and other routine business transacted.

Adjourned.

June 14th, 1911.—The Board met at the Hotel Patten, Chattanooga, Tenn., during the Annual Convention; President Endicott in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Bates, Bensel, Clarke, Courtenay, McDonald, and Ridgway.

No quorum being present, the Board adjourned.

June 30th, 1911.—A Special Meeting of the Board to canvass ballots for membership and to consider applications for membership was held at 5 P. M.; President Endicott in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Boller, Clarke, Kimball, Loomis, Ridgway, and Thompson.

Ballots for membership were canvassed resulting in the election of 12 Members, 29 Associate Members, and 21 Juniors, and the transfer of 4 Juniors to the grade of Associate Member.

Nine Associate Members were transferred to the grade of Member. Applications were considered.

Adjourned.

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

September 6th, 1911.—8.30 P. M.—A regular business meeting will be held, and a paper by George B. Francis and Joseph H. O'Brien, Members, Am. Soc. C. E., entitled "The New York Tunnel Extension of the Pennsylvania Railroad: Certain Engineering Structures of the New York Terminal Area," will be presented for discussion.

This paper was printed in *Proceedings* for May, 1911.

September 20th, 1911.—8.30 P. M.—Two papers will be presented for discussion at this meeting, as follows: "Mule-Back Reconnaissances," by William J. Millard, Jun. Am. Soc. C. E., and "Economic Canal Location in Uniform Countries," by Lyman E. Bishop, Jun. Am. Soc. C. E.

Mr. Millard's paper was printed in *Proceedings* for May, 1911, and Mr. Bishop's paper is printed in this number of *Proceedings*.

October 4th, 1911.—8.30 P. M.—This will be a regular business meeting. A paper by Wilson Sherman Kinnear, M. Am. Soc. C. E., entitled "The Detroit River Tunnel," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

October 18th, 1911.—8.30 P. M.—At this meeting a paper by George Gibbs, M. Am. Soc. C. E., entitled "The New York Tunnel Extension of the Pennsylvania Railroad: Station Construction, Road, Track, Yard Equipment, Electric Traction, and Locomotives," will be presented for discussion.

This paper was printed in *Proceedings* for May, 1911.

PROPOSED CHANGE IN METHOD OF SOCIETY PUBLICATIONS

The following suggestions of the Secretary have been presented to the Board of Direction and are now under consideration by the Board. This report was presented at the Business Meeting of the Annual Convention, June 14th, 1911, and is here reproduced as containing information which will be of interest to the membership.

TO THE BOARD OF DIRECTION,

AMERICAN SOCIETY OF CIVIL ENGINEERS:

It has occurred to the Secretary that there would be many advantages if a change were made in the method of getting out our publications, and he has been investigating its possibilities for some time, and now brings the proposed plan to the attention of the Board in order that its essential features may be discussed sufficiently in advance of the possible time for putting it into practice, so that it may be decided upon, if the details can be worked out properly, or rejected as not wise on general principles.

Beginning with 1909, the *Transactions* have been issued in 4 volumes per annum (and there was an extra volume for 1910 which has not yet been issued). Each of these volumes contains on the average 550 to 600 pages.

The disadvantages of this system are:

(1) The great difficulty in closing up the discussion on a sufficient number of papers to make up the necessary number of pages for each volume and have it ready for issue quarterly.

(2) The time necessary to box, address, and mail each of these volumes (it now takes about $4\frac{1}{2}$ weeks for each, or about one-third of the year for the four), which work must be done by the office force. This is rapidly becoming a burden as the edition increases.

(3) The cost of postage on the number of bound volumes (which now amounts to 3 700 out of a total edition of 6 300). On the average this is 25 cents per volume, or \$1 per year, for each member who orders the binding.

(4) The cost for binding to each member, which is \$4 per annum for half-morocco and \$2 per annum for cloth, an average of \$3, which, multiplied by the number of members who now secure binding, 3 700 = \$11 100 per annum.

(5) The necessary limitation of the publication of discussions on any paper to one number of *Proceedings*. Because, if continued, discussions could not be closed in time for final publication in the quarterly volumes.

(6) When put upon the shelves, there are 4 separate indexes to look through to find a paper or discussion published in any one year.

Briefly, the scheme is to continue the publication of *Proceedings* as heretofore, but to publish only one volume of *Transactions* per annum, said volume to contain as much matter (as many pages, plates, etc.) as the four volumes now published.

This can be done by the use of thin "India," or, as it is sometimes called, "Bible" paper.*

The effect upon the disadvantages of the present system as stated above would be:

(1) The discussion on any paper need not be hurriedly closed, and could continue to be printed in *Proceedings* until all members have been heard from.

(2) The time necessary for boxing, mailing, etc., would be about one-quarter what it is now.

(3) The item of postage would be materially reduced, due to the difference in weight of paper and binding. With the present edition the saving would be about \$1 500 and, of course, this saving would be increased rapidly as the edition increases.

(4) The direct individual saving to the Membership would be

* With this report were submitted dummies of volumes containing, page for page, the 4 volumes issued in 1910. These are somewhat less than $2\frac{3}{4}$ inches thick.

approximately \$2 each for binding, which multiplied by the number of members who now secure binding, 3 700 = \$7 400 total aggregate saving per annum. This is, of course, constantly increasing.

(5) The value of *Proceedings* would be increased by the publication therein of additional discussion and cross-discussion, and consequently they will be used more. In this connection, there should be added to each Number a Table of Contents covering the technical part from the beginning of each year to date.

(6) There would be one index covering the *Transactions* for each year instead of four.

(7) The space occupied on the shelf would be about four-tenths of that necessary for the four volumes.

The Secretary has talked of this suggested change with many members, and practically all have expressed approval of it. There have been a few mild objections advanced, for instance: One member said a volume of that size is hard to hold in the hand when reading—it must be placed on a table. Against this, one profoundly literary member, who has published many books, said, "Our present volumes are not thick enough to look dignified on the shelf."

It cannot be denied that the thin paper leaves are not so easy to turn when reading, and if this were a volume which is taken from the shelves to be read from cover to cover, there would be much to say against it, but it is really a book of reference, only consulted occasionally.

As to durability: investigation shows that, if anything, the thin paper stands the wear and tear of library use better than the thick. Almost all handbooks are on thin paper (usually not of as good quality as that proposed for our use), and they are more used than any other books in the Reading-room. They stand well.

The Secretary is not prepared to give definite figures as to the difference in cost of the two systems, but has gone far enough into this to be able to say that there will be very little, if any, additional expense, and that if the saving of postage, time of office force, as well as aggregate extra expense to Members for binding are considered, the result would in his opinion be in favor of the proposed change.

The Secretary has arranged with our printer to have 200 copies of the volume now going through the press struck off on this thin paper, which the binder will make up into 50 volumes (this representing fairly well the bulk of 4 volumes), binding some of these in half-morocco, some in cloth, and some in paper. We will then be able to see how the whole edition will look, and more accurate estimates of cost can be made by both printer and binder than have been possible to date.

Respectfully submitted,

CHAS. WARREN HUNT,
Secretary.

JUNE 6TH, 1911.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members, who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that, if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work, the Appendices* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*. The issue of volumes of *Transactions* is dependent on the closing of discussions, and the co-operation of the membership in this matter is essential to the regular issue of each quarterly volume.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings*, and set down for presentation to a future meeting of the Society, and, on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which, from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not

* *Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions, only, will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

SUBSCRIPTION PRICE TO THE PUBLICATIONS OF THE SOCIETY

The following subscription rates have been fixed by the Board of Direction for the publications of the Society:

Proceedings, ten Numbers per annum, \$8. Price for single numbers, \$1.

Transactions, four Volumes per annum, \$12. Price for single volumes, \$4.

On the above prices there is a discount of 50% to members who desire extra copies of any of these publications, and of 25% to Libraries and Book-dealers.

There is also an additional charge per annum, to cover foreign postage, of 75 cents for *Proceedings* and \$1 for *Transactions*, or 8 cents and 25 cents, respectively, for single numbers.

A special subscription rate has been fixed by the Board for the *Proceedings* of the Society for the benefit of Students in Technical Schools. This rate is \$4.50 per annum, and is available to any *bona fide* student of any technical school.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 p. m., at the Palace Hotel, on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 p. m. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest of the Association at any of the above meetings, if he will notify the Secretary that he is in San Francisco.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on applica-

tion to the Secretary, Gavin N. Houston, M. Am. Soc. C. E., 409 Equitable Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, and until further notice, will take place at The Colorado Traffic Club.

Visiting members are urged to attend the meetings and luncheons.

(Abstract of Minutes of Meeting)

May 27th, 1911.—The meeting was called to order; Vice-President Comstock in the chair; G. N. Houston, Secretary; and present, also, 27 members and 36 guests.

The minutes of the April meeting were read and approved.

President Anderson delivered a lecture on the Panama Canal, illustrating his remarks with lantern slides.

Adjourned.

**PRIVILEGES OF ENGINEERING SOCIETIES
EXTENDED TO MEMBERS OF THE
AMERICAN SOCIETY OF CIVIL ENGINEERS**

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms and at all Meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street,
New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66,
Germany.

Associação dos Engenheiros Civis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria,
Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston,
Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 413 Dorchester Street, West,
Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building,
Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniørforening, Amaliegade 38, Copenhagen, Denmark.

Engineers' and Architects' Club of Louisville, Ky., 303 Norton
Building, Fourth and Jefferson Streets, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis,
Minn.

- Engineers' Club of Philadelphia**, 1317 Spruce Street, Philadelphia, Pa.
Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.
Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont., Canada.
Engineers' Society of Northeastern Pennsylvania, 302 Board of Trade Building, Scranton, Pa.
Engineers' Society of Pennsylvania, 219 Market Street, Harrisburg, Pa.
Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburg, Pa.
Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.
Institution of Engineers of the River Plate, Buenos Aires, Argentine Republic.
Institute of Naval Architects, 5 Adelphi Terrace, London, W. C., England.
Junior Institution of Engineers, 39 Victoria Street, Westminster, S. W., London, England.
Koninklijk Instituut van Ingenieurs, The Hague, The Netherlands.
Louisiana Engineering Society, 321 Hibernia Bank Building, New Orleans, La.
Memphis Engineering Society, Memphis, Tenn.
Midland Institute of Mining, Civil and Mechanical Engineers, Sheffield, England.
Montana Society of Engineers, Butte, Montana.
North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England.
Oesterreichischer Ingenieur- und Architekten-Verein, Eschenbachgasse 9, Vienna, Austria.
Pacific Northwest Society of Engineers, 803 Central Building, Seattle, Wash.
Rochester Engineering Society, Rochester, N. Y.
Sachsischer Ingenieur- und Architekten-Verein, Dresden, Germany.
Sociedad Colombiana de Ingenieros, Bogota, Colombia.
Sociedad de Ingenieros del Peru, Lima, Peru.
Societe des Ingenieurs Civils de France, 19 Rue Blanche, Paris, France.
Society of Engineers, 17 Victoria Street, Westminster, S. W., London, England.
Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm, Sweden.
Tekniske Forening, Vestre Boulevard 18-1, Copenhagen, Denmark.
Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

ACCESSIONS TO THE LIBRARY

(From May 8th to August 1st, 1911)

DONATIONS ***THE PRINCIPLES OF SCIENTIFIC MANAGEMENT.**

By Frederick Winslow Taylor. Cloth, 9 x 6 in., 144 pp. New York and London, Harper & Brothers, 1911. \$1.50.

The author states that it has been his object to point out the great losses sustained through inefficiency; to convince the reader that the remedy for this inefficiency lies in systematic management and not the man; to prove that the best management is founded on clearly defined laws, rules and principles which can be applied to any human activity; and to illustrate by examples the astounding results to be obtained by the application of these principles. The Contents are: Fundamentals of Scientific Management; The Principles of Scientific Management.

MUNICIPAL FRANCHISES.

A Description of the Terms and Conditions Upon Which Private Corporations Enjoy Special Privileges in the Streets of American Cities. By Delos F. Wilcox. Vol. II.—Transportation Franchises; Taxation and Control of Public Utilities. Cloth, 8 x 6 in., 21 + 885 pp. New York, The Engineering News Publishing Company, 1911. \$5.00.

The first volume of this work, which was published in 1910, contained a general analysis of the subject and a description of typical municipal franchises in operation in the United States covering those utilities which are distributed by pipes or wires in the public streets, such as electric light and power, the telegraph, the telephone, etc. In this, the second volume, Part III is devoted to a description of local transportation franchises in a large number of American cities, namely, street railways, elevated railroads, subways, interurban railways, bridges, viaducts, toll roads, depots, belt line railroads, spur tracks, docks, markets, ferries, and omnibus lines. The author especially commends the chapter on "Elements of a Model Street Railway Franchise" to readers as containing important constructive suggestions. Part IV relates to a number of interesting and important items in the general franchise problem, such as the constitutional and statutory safe-guarding of franchise procedure, the regulation of public utilities by State and local commissions, franchise taxation, capitalization, and municipal ownership. The concluding chapters are stated to contain only a brief statement of what the author considers to be the more important general principles which should govern public activities in relation to the public utility problems considered therein. There is an Appendix containing the Minneapolis Gas Franchise passed February 23d, 1910, and the Minneapolis Gas Regulation Ordinance passed March 24th, 1910, which is followed by an extensive Index.

PRACTICAL SILO CONSTRUCTION.

By A. A. Houghton. (Concrete Worker's Reference Books, No. 3.) Paper, 7½ x 5 in., illus., 69 pp. New York, The Norman W. Henley Publishing Company, 1911. 50 cents.

This book is stated to contain complete data, working drawings, and specifications for the construction of concrete silos of any type, with illustrations of unpatented moulds and forms for monolithic and block silos. The Chapter headings are: The Concrete Silo; Requirements of a Silo; Size of Silo to Erect; Foundations for the Silo; Foundation with Floor Below Ground-Level; Forms for Monolithic Walls Without Air-Chamber; A Simple and Inexpensive Silo Form; Method of Raising Forms; Using Automatic Clamp; Plastered Silos; Concrete Block Silos; Concrete for Silo Work; Reinforcement of Silos; Doors for the Silo; Silo Roofs; Ornamental Roof or Wall for Silo; Index.

MOLDING CONCRETE CHIMNEYS, SLATE AND ROOF TILES.

By A. A. Houghton. (Concrete Worker's Reference Books, No. 4.) Paper, 7½ x 5 in., illus., 61 pp. New York, The Norman W. Henley Publishing Company, 1911. 50 cents.

In a secondary title, it is stated that this book is a practical treatise explanatory of the construction of block and monolithic types of concrete chimneys with

* Unless otherwise specified, books in this list have been donated by the publishers.

easily constructed moulds for the same. The construction of monolithic concrete roofs, together with the moulding of concrete slate, roof tiles and slabs, is also discussed, and working drawings for the construction of an automatic tamping machine for moulding concrete slate with great rapidity, are included. The Contents are: Requisites of Chimney Construction; Constructing Small Monolithic Chimneys; Inter-locking Blocks for Small Concrete Chimneys; Ornamental Molds for Chimneys; Inter-locking Blocks for Large Chimneys; Forms for Large Monolithic Concrete Chimneys; Octagonal Monolithic Form; Various Types of Concrete Roofs; Monolithic Type of Concrete Roof; A Simple Bracket for Concrete Roof Construction; Molding an Ornamental Concrete Roof; Concrete Roof of Reinforced Slabs; Concrete Slate or Tile Roofs; Machine or Mold for Concrete Slate; Molding Hip, Ridge Roll, and Gable Ornaments; Preparing Plans for Roof Loads; Index.

MOLDING AND CURING ORNAMENTAL CONCRETE.

By A. A. Houghton. (Concrete Worker's Reference Books, No. 5.) Paper, $7\frac{1}{2} \times 5$ in., illus., 58 pp. New York, The Norman W. Henley Publishing Company, 1911. 50 cents.

The various methods of moulding and curing ornamental concrete are here presented, it is stated, as the work would progress in practice. After describing the preparation of the moulds, the coating of the moulds to prevent sticking, and the various methods for filling them with the concrete mixture, the author explains the removal of the moulds and the repair of defects in the cast, as well as the various methods of surface treatment of the concrete and of curing the work. Detailed instructions are given for moulding imitation marble and granite, together with the proper proportions of cements and aggregates for use in the various finishes. The use of various coloring agents is explained, and instructions are included for making moulds for ornamental concrete, glue, wood, etc. The moulding of plaster patterns for use in making cast-iron moulds is also discussed.

CONCRETE MONUMENTS, MAUSOLEUMS AND BURIAL VAULTS.

By A. A. Houghton. (Concrete Worker's Reference Books, No. 6.) Paper, $7\frac{1}{2} \times 5$ in., illus., 65 pp. New York, The Norman W. Henley Publishing Company, 1911. 50 cents.

In this volume the author describes the moulding of various types of concrete monuments, together with methods for constructing moulds for the same. The work of lettering and the placing of inscriptions is explained, as well as the cutting of ornamental designs in the concrete after it has been cured. Plans and designs for mausoleums and burial vaults are also given with complete details of construction.

MILITARY TOPOGRAPHY FOR THE MOBILE FORCES.

Including Map Reading, Surveying and Sketching. By Captain C. O. Sherrill, Corps of Engineers, U. S. Army. Second Edition. Cloth, $8\frac{1}{2} \times 5\frac{3}{4}$ in., illus., 18 + 353 pp. Menasha, Wis., George Banta Publishing Co., 1911. \$2.50. (Donated by the Author.)

The author states that the needs of the Military Service require, on the part of all its officers, a thorough knowledge of the uses and making of topographical maps of small areas, and the relation between the map and the ground, together with a practical knowledge of the making of topographical sketches at a rapid rate, so that the maps and sketches can be combined to show the entire front of a division at the end of each day's march. This book, it is stated, has been written with the intention of aiding the men to acquire this knowledge, and the hope is expressed that the methods described may also prove of value to beginners in the study of Civil Engineering, especially to those of limited mathematical training. All difficult mathematical discussion has been omitted, together with descriptions and methods of using obsolete and unnecessary surveying instruments. Part I, Military Map Reading, is said to be a statement of the principles and a solution of the problems essential to the accurate and rapid use of maps for military purposes, such as tactical map problems, war games, and maneuvers. A number of problems and their solutions are given, but these are said to be limited to such as have practical military value. Part I is stated to provide a complete reference book on Military Map Reading. In Part II, Military Topographical Surveying, the author describes methods of using surveying instruments, especially the plane table and stadia, as the best means of acquiring skill in estimating distances, slopes, and elevations, accurately. In Part III, Military Sketching, the methods used at the Army Service Schools in rapid military sketching are described in detail, especial emphasis being laid on practical methods of estimating distances, horizontal angles, slopes, and eleva-

tions. This book has been adopted as a textbook at the Army Service Schools at Fort Leavenworth, Kansas, at Garrison Schools for Officers, and at the Coast Artillery School at Fort Monroe, Virginia.

WHITTAKER'S ELECTRICAL ENGINEER'S POCKET BOOK.

Edited by Kenelm Edgcumbe. Third Edition, Revised. Cloth, $6\frac{1}{2} \times 4$ in., illus., 8 + 597 pp. London and New York, Whittaker & Co., 1911. 5 shillings. (Donated by The Macmillan Company.)

Quoting from the preface to the first edition, the editor states that the Pocket Book will be found to contain a kind of synopsis of each subject given, brought up to date, and that owing to the great specialization which the rapid growth of electrical engineering has necessitated, it is of the utmost importance to know where to turn for reliable and up-to-date information, and he believes that this volume will fulfill this purpose, for while the various sections will be found to be sufficiently detailed for all ordinary requirements, copious references are given to various recent papers and publications containing full treatment of the subject in case further study is desired. These statements are said to apply to this, the third edition, a greater part of which has been re-written and every line of which has been checked for misprints and inaccuracies. The Contents are: Useful Numbers, etc.; Mathematics and Physics; Practical Mechanics; Electrical Tables; Magnetism; Electricity; Electrical Measuring Instruments; Electric Clocks; Electric Lighting; Secondary Batteries; Heavy Current Resistances; Direct Current Motors and Dynamos; Alternating Current Machines; Testing Generators, Motors and Transformers; Electrical Transmission of Power; Electric Traction; Switches and Switch-Gear; Electro-Metallurgy and Electro-Chemistry; Electric Power Stations and Mains; Legal Information; Index.

MONOPLANES AND BIPLANES.

Their Design, Construction and Operation: The Application of Aerodynamic Theory with a Complete Description and Comparison of the Notable Types. By Grover Cleveland Loening. Cloth, $8\frac{1}{2} \times 6$ in., illus., 14 + 331 pp. New York, Munn & Company, Inc., 1911. \$2.50.

The preface states that in this book the author has presented the subject of the aeroplane in a manner which he hopes will be intelligible and interesting to the average man as well as valuable to the more learned student. The subject-matter is divided into three parts. In Part I, after an historical introduction relating to the work of Langley, Lillenthal, and Chanute, the design of aeroplanes is discussed in a simple and thorough manner and the fundamental principles are explained, a complete example of the design of an aeroplane being given. Part II is devoted to detailed descriptions of the various successful types of monoplanes and biplanes, with photographs and diagrams. In Part III the leading types of monoplanes and biplanes are discussed and compared, and lines of probable future development are suggested. This part contains a chapter on the causes of fatal accidents which have occurred, and means of preventing such accidents are considered. The Contents are: Part I, The Design of Aeroplanes; Introduction; The Resistance of the Air and the Pressure on Normal Planes; Flat Inclined Planes; The Pressure on Curved Planes; The Frictional Resistance of Air; The Center of Pressure on Flat and Curved Planes; The Effect of Depth of Curvature and Aspect Ratio Upon the Lift and Drift of Curved Planes; Numerical Example of the Design of an Aeroplane. Part II, Detailed Descriptions of the Notable Aeroplanes; Introduction; Important Types of Monoplanes; Prominent Types of Biplanes. Part III, Comparison of the Types; Comparison of the Prominent Types; Controlling Apparatus; Accidents; The Variable Surface Aeroplane; Index.

GOOD ENGINEERING LITERATURE.

What to Read and How to Write, with Suggestive Information on Allied Topics. By Harwood Frost. Cloth, $8 \times 5\frac{1}{2}$ in., 12 + 422 pp. Chicago, The Author, 1911. \$1.00.

The material contained in this book is stated to be a compilation and elaboration of addresses by the author, before engineering students, in the early part of 1910. It is intended, it is stated, as an aid to practicing engineers and engineering students in the making, selecting, and reading of engineering literature by outlining the application of the fundamentals of literary expression to special lines of work, by indicating how to collect, select, and arrange their information, and prepare it for publication, and by assisting the engineer in the selection and reading of his professional literature, and in the collection and preserva-

tion of information on various engineering subjects; in short, the book is intended to aid the engineer to speak and write clearly, to express his thoughts forcibly, and to describe his work so that others will understand it. In order to assist the writer in the preparation and marketing of his literary work, information is also given regarding the theory and practice of the publishing business. The Chapter Headings are: Literary Expression; Rhetoric and Grammar; Orthography and Punctuation; Words and Phrases; Inspiration and Motive in Literary Work; Essentials to Success in Literature; What to Write About; Collecting and Arranging Material; Exercising the Memory; Preparation of Manuscripts for Publication; "Field" and "Policy" of Technical Journals; The "Write-Up" Article; Rights of an Author in His Works; Copyright; Relations Between Author and Publisher; The Law of Libel; Preparation of Illustrations for Reproduction; The Making of a Book; Indexing and Filing; Literary Criticism; The Engineer's Library; List of Technical Indexes Appearing Serially; Index.

HISTORY OF BRIDGE ENGINEERING.

By Henry Grattan Tyrrell. Cloth, $9\frac{1}{2} \times 6\frac{1}{2}$ in., illus., 479 pp. Chicago, The Author, 1911. \$4.00.

The author states that "proficiency in any art or science is not attained until its history is known," and that very little time or thought has been given to the History of Engineering by the Engineering Schools, the cause being attributed usually to dearth of literature on the subject. He therefore presents this book, stating that, while it is essentially the historical part of a comprehensive work on the subject, theory and method of design having been omitted purposely, the large number of illustrations should make it useful for reference, especially in selecting economic types of bridges and in preparing comparative designs and estimates. He has classified and described the various types of bridges, with the exception of movable bridges, from the earliest times, the greater part of the book being devoted, however, to bridges of the last century. The Contents are: Egyptian, Babylonian and Persian Bridges; Roman Bridges; Mediæval Bridges; Renaissance Bridges; Modern Stone Bridges; Pontoon Bridges; Aqueduct Bridges; Wooden Bridges; Cast Iron Bridges; Simple Truss Bridges; Tubular and Plate Girder Bridges; Suspension Bridges; Cantilever Bridges; Wrought Iron and Steel Arches; Trestles and Viaducts; Solid Concrete Bridges; Reinforced Concrete Bridges; Index.

CONSTRUCCIONES DE HORMIGON ARMADO.

Por Juan Manuel de Zafra. Primera Parte, Mecánica del Hormigón Armado. Paper, $9\frac{1}{2} \times 6\frac{1}{2}$ in., illus., 8 + 292 pp. Madrid, V. Tordesilla, 1911. (Donated by the Author.)

The Chapter headings are: Idea General del Hormigón Armado; Resistencia y Elasticidad del Hormigón Armado; Cálculo en General, Cargas Uniformes; Flexión Sencilla; Flexión Compuesta; Cargas Transversales; Deformación y Solidaridad; Hormigón Zunchado; Apéndice.

TUBERCULOSIS HOSPITAL AND SANATORIUM CONSTRUCTION.

Written for the National Association for the Study and Prevention of Tuberculosis. By Thomas Spees Carrington. Cloth, $10\frac{1}{2} \times 7$ in., illus., 164 pp. New York, The National Association for the Study and Prevention of Tuberculosis, 1911. 25 cents. (Donated by the Author.)

This work is an expansion of a pamphlet issued in 1909 by the Association and is intended as a guide in the design and construction of hospital and sanatorium buildings for the institutional care of tuberculous patients. The information contained herein is stated to have been collected during a series of investigations into the methods and materials used in the construction of buildings at various institutions for the treatment of patients with all varieties and in all the stages of tuberculous disease. The results of studies on the question of sites, to determine the effect of location and surroundings from both the clinical and economic points of view, are also included. The book contains many illustrations and plans of tuberculosis hospitals and sanatoria in various parts of the United States. The Contents are: Site and Grouping; Administration Buildings; Administration Buildings and Patients' Quarters Combined; Hospitals for Advanced Cases; Infirmarys and Reception Hospitals; Patients' Quarters; Lean-To Type of Building; Patients' Quarters; Cottage Type of Building; Illustrations.

Gifts have also been received from the following:

- Aachen Kgl. Technische Hochschule. 1 pam.
 Alabama Polytechnic Inst. 1 vol.
 Alaska Mexican Gold Min. Co. 1 pam.
 Alaska United Gold Min. Co. 1 pam.
 Albany, N. Y.-Bureau of Water. 1 pam.
 Allen, W. F. 1 vol.
 Am. Electrochemical Soc. 1 vol.
 Am. Inst. of Archts. 2 vol.
 Am. Inst. of Min. Engrs. 1 vol.
 Am. Telephone & Telegraph Co. 1 pam.
 Amsterdam, N. Y.-Water Commrs. 1 pam.
 Anschütz & Co. 1 bound vol.
 Asociacion de Ing. y Arquitectos de Mexico. 1 pam.
 Assoc. of Transportation and Car Accounting Officers. 2 pam.
 Automobile Club of America. 1 pam.
 Baltimore, Md.-Harbor Board. 1 pam.
 Bates, Onward. 4 pam.
 Belzner, Theodore. 1 pam., 1 vol.
 Black, William M. 1 bound vol.
 Bombay, India-Public Works Dept. 1 vol.
 Boston, Mass.-Public Library. 1 pam.
 Boston Soc. of Civ. Engrs. 1 pam.
 British Columbia-Dept. of Mines. 2 vol.
 Brooklyn, N. Y.-President of the Borough. 1 bound vol.
 Brooklyn Polytechnic Inst. 1 pam.
 Buffalo, N. Y.-Bureau of Water. 1 pam.
 Buffalo, N. Y., Chamber of Commerce. 2 vol., 2 pam.
 Burton, Theodore E. 1 pam.
 Cairns, R. A. 1 pam.
 California-R. R. Comm. 1 bound vol.
 Cambridge Univ. & Town Water Works Co. 1 pam.
 Canada-Conservation Comm. 1 bound vol.
 Canada-Dept. of Marine and Fisheries. 1 bound vol., 1 pam., 15 maps.
 Canada-Dept. of Mines. 2 vol.
 Canada-Dept. of Public Works. 1 vol.
 Canada-Geol. Survey. 1 vol., 4 pam., 1 map.
 Carnegie Steel Co. 1 pam.
 Chemin de Fer de Paris à Orléans. 1 vol.
 Chemin de Fer du Nord. 1 pam.
 Chemin de Fer Métropolitain de Paris. 2 pam.
 Chemins de Fer de l'Est. 1 pam.
 Chemins de Fer de Paris à Lyon et à la Méditerranée. 1 pam.
 Chicago, Ill.-Bureau of Public Efficiency. 1 pam.
 Colorado-Agril. Exper. Station. 9 pam.
 Comstock, Charles W. 1 bound vol.
 Concord, N. H.-Board of Water Commrs. 1 pam.
 Congrès des Ing. en Chef des Assoc. de Propriétaires d'Appareils à Vapeur. 1 vol.
 Congreso Científico, Cuarto. 2 vol.
 Connecticut-State Board of Health. 1 bound vol.
 Davis, George A. 2 bound vol.
 Delaware Coll. 1 pam.
 Doyer, A. Elberts. 1 pam.
 East Indian Ry. Co. 1 pam.
 Egyptian Delta Light Rys., Ltd. 2 pam.
 Engrs.' Club. 1 bound vol.
 Erie, Pa.-Commrs. of Water-Works. 1 pam.
 Eustice, John. 2 pam.
 Florida, Univ. of. 1 pam.
 Focht, Benjamin K. 1 pam.
 Ford, Bacon & Davis. 2 bound vol.
 Frodair Iron & Steel Co. 1 pam.
 Grand Rapids & Indiana Ry. Co. 1 pam.
 Great Britain-Patent Office. 10 vol.
 Great Eastern Ry. Co. 3 pam.
 Grunsky, C. E. 1 pam.
 Hannover Kgl. Technische Hochschule. 1 pam.
 Harts, William W. 2 pam.
 Haverhill, Mass.-Board of Water Commrs. 1 pam.
 Haverhill, Mass.-City Engr. 1 pam.
 Heldt, H. L. 1 pam.
 Houston, John J. L. 12 vol., 1 pam.
 Hunter, Adam. 1 bound vol.
 Idaho Soc. of Engrs. 1 pam.
 Illinois-Bureau of Labor Statistics. 1 pam.
 Illinois-R. R. and Warehouse Comm. 3 pam.
 Illinois-State Water Survey. 1 vol.
 Illinois Soc. of Engrs. and Surv. 1 vol.
 Illinois, Univ. of-Agril. Exper. Station. 2 pam.
 India-Public Works Dept. 1 pam.
 India-Ry. Board. 1 vol.
 Indian Midland Ry. Co., Ltd. 1 pam.
 Indiana-State Library. 1 pam.
 Indiana San. and Water Supply Assoc. 1 pam.
 Institution of Mech. Engrs. 1 vol.
 Iowa-Auditor of State. 1 bound vol.
 Iowa-Geol. Surv. 1 bound vol.
 Iowa-State Board of R. R. Commrs. 1 pam.
 Iowa Eng. Soc. 1 vol.
 Junior Institution of Engrs., Inc. 1 bound vol.
 Kulchling, Emil. 1 bound vol.
 Lawrence, Mass.-City Engr. 1 pam.
 Lawrence, Mass.-Water Board. 1 pam.
 Lelsen, T. A. 1 pam., 1 bound vol.
 Lewis, John H. 1 bound vol.
 Lewiston, Me.-Water Board. 1 pam.
 London, Brighton & South Coast Ry. Co. 1 pam.
 Long Island R. R. Co. 1 pam.
 Louisiana-State Univ. 1 vol.
 Lowell, Mass.-Water Board. 1 pam.
 Magyar Mernok-es Epitesz-Egyelet. 1 pam.
 Maine-Commr. of Highways. 2 bound vol.
 Maine-Dept. of Vital Statistics. 1 bound vol.
 Maine-Forest Commr. 4 bound vol.
 Maine-Insurance Dept. 2 pam.
 Maine-State Board of Health. 1 bound vol.
 Manchester, N. H.-Board of Water Commrs. 1 pam.
 Marlborough, Mass.-Water Commrs. 1 pam.
 Massachusetts-Board of Gas and Elec. Light Commrs. 1 vol.
 Massachusetts-Board of Metropolitan Park Commrs. 1 bound vol.
 Massachusetts-Highway Comm. 1 bound vol.
 Massachusetts-Metropolitan Water and Sewerage Board. 2 bound vol.

- Massachusetts-State Board of Health. 2 bound vol.
 Massachusetts-State Forester. 1 pam.
 Mead, Daniel W. 3 vol., 2 pam.
 Memphis, Tenn.-Artesian Water Dept. 1 pam.
 Metropolitan Ry. Co. 1 pam.
 Mexican Ry. Co., Ltd. 2 pam.
 Michigan-State Board of Geol. Survey. 3 bound vol., 2 vol., 3 pam.
 Min. and Metallurgical Soc. of America. 1 pam.
 Minneapolis, Minn.-Board of Park Commrs. 1 pam.
 Minnesota-R. R. and Warehouse Comm. 1 bound vol.
 Mississippi River Power Co. 1 pam.
 Missouri, Univ. of-School of Mines and Metallurgy. 2 vol., 7 pam.
 Municipal Engrs. of the City of New York. 1 pam.
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BURGESS, PHILIP. Hydr. and Chemical Engr. (Burgess & Long), 828 Cols. Savings and Trust Bldg., Columbus, Ohio.....	{ Assoc. M. M.	Nov. 7, 1906
		June 30, 1911
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CHIEW, RICHARD SANDERS. 607 Humboldt Bank Bldg., San Francisco, Cal.....	{ Assoc. M. M.	Sept. 5, 1906
		June 30, 1911
COOLEY, MORTIMER ELWYN. Prof. of Mech. Eng., and Dean, Dept. of Eng., Univ. of Michigan, Ann Arbor, Mich.....		May 2, 1911
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		Oct. 3, 1900
		June 30, 1911
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		May 2, 1911
DOWNES, LAWRENCE ALOYSIUS. Asst. to Chf. Engr., M. of W., Ill. Cent. R. R., Fort Dodge, Iowa.....		Sept. 6, 1910
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FESSENDEN, RALPH SETH. Chf. Engr., Twin Falls-Raft River Land & Water Co., Rupert, Idaho.....		May 2, 1911

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HEDKE, CHARLES RICHARD. Box 1106, Fort Collins, Colo.		June	6, 1911
HODGKINS, HENRY CLARENCE. Cons. Engr., 514 Dillaye Bldg., Syracuse, N. Y.....		June	6, 1911
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	M.	June	6, 1911
HOWELL, WILLIAM AUGUSTUS. Engr., Streets and Highways, City Hall, Newark, N. J.	Assoc. M.	April	3, 1907
	M.	June	6, 1911
HOYT, WILLIAM HAUSMER. Asst. Chf. Engr., Duluth, Mis- sabe & Northern Ry., 401 Wolvin Bldg., Duluth, Minn.....		June	30, 1911
HULL, GEORGE BECKLEY. Asst. Engr., Dept. Public Works, Dominion of Canada, North Temiskaming, Que., Canada.....		May	2, 1911
HUNT, WILLIAM HENRY. Cons. Engr. (Duncan & Hunt), 29 Broadway, New York City.....		June	30, 1911
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LAVELLE, THOMAS MONAHAN. Engr. with The Eastern Steel Co., Pottsville, Pa.....	Assoc. M.	Sept.	7, 1904
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	M.	Feb.	28, 1911

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TRESISE, FRANCIS JOHN. Pres. and Mgr., Erie Contr. Co., 400 D. S. Morgan Bldg., Buffalo, N. Y.....		June	6, 1911
VAN LOAN, SETH MORTON. First Asst. to Chf., Bureau of Water, Room 790, City Hall, Philadelphia, Pa.....	Jun.	Dec.	28, 1900
	Assoc. M.	Oct.	7, 1903
	M.	May	2, 1911
VEHRENKAMP, HENRY WILLIAM. Chf. Engr., Ferro-Concrete Constr. Co., 3113 Mur- dock Ave., Cincinnati, Ohio.....	Assoc. M.	June	5, 1907
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WAGNER, HARRY EDWARD. Res. Engr., D., L. & W. R. R. Co., Andover, N. J.....	Assoc. M.	Nov.	6, 1907
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	M.	June	6, 1911

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	Assoc. M.	Nov. 1, 1904
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DAWSON, JAY BOSWORTH. P. O. Box 51, Sta. C, Los Angeles, Cal.....		June 30, 1910
DESSERTY, FLOYD GOSSETT. (Desserty & West), 1117 Union Trust Bldg., Los Angeles, Cal.....		Feb. 28, 1911
DOBSON, GILBERT COLFAX. Gatun, Canal Zone, Panama....		May 2, 1911
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EDMONDSON, RALPH SELDEN. Asst. Engr., Board of Water Supply, City of New York, High Falls, N. Y.....		June 6, 1911
ELDER, ERNEST HARTWELL. Office Engr., C. H. Swigart, Box 1175, North Yakima, Wash.....		June 30, 1911
ELLSTROM, VICTOR EDWIN. St. Louis Representative and Structural Engr., Bethlehem Steel Co., 1015 Chemical Bldg., St. Louis, Mo.....		Dec. 6, 1910
EMERSON, CHARLES ALVIN, JR. Prin. Asst. Engr., Pennsylvania Dept. of Health, Harrisburg, Pa.....		June 30, 1911
FELGENHAUER, FRANK JOHN. Chf. Engr., E. Felgenhauer's Sons (Res., 1439 Dean St.), Brooklyn, N. Y.....	Jun. May 4, 1909 Assoc. M. June 30, 1911	
GASS, ELMER JOHN. P. O. Box 459, Everett, Wash.....		Dec. 6, 1910
GASTON Y ROSELL, FRANCISCO JOSÉ. Engr. in Chg., Dredging Work, Isabela de Sagua Harbor, Isabela de Sagua, Cuba.....		June 6, 1911
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GILMAN, CHARLES. 1228 Lenox Ave., Plainfield, N. J.....	Jun. Dec. 6, 1904 Assoc. M. June 6, 1911	
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	Assoc. M.	June 6, 1911	
HESLOP, DERWENT GORDON. Res. Engr., Canton-Hankow Ry., Care, Imperial Post Office, Shiuchow-Fu, Kwang- tung, South China.....		May 2, 1911	
HEWERDINE, THOMAS SLOAN. Box 161, Fisher, Ill.....		June 30, 1911	
HOARD, CLARENCE. Chf. Engr., Victoria & Barkley Sound Ry., P. O. Box 216, Victoria, B. C., Canada.....		Feb. 28, 1911	
HOSMER, RALPH HERBERT. 711 Telegraph Bldg., Harris- burg, Pa.....		Dec. 6, 1910	
HUTCHINGS, JOHN BACON, JR. Room 114, Eng. Hall, Univ. of Illinois, Urbana, Ill.....	Jun.	Sept. 6, 1904	
	Assoc. M.	May 2, 1911	
JACOBOSKY, GILBERT GARFIELD. Cons. Engr., 116 Second National Bank Bldg., Wilkes-Barre, Pa.....	Jun.	Nov. 5, 1907	
	Assoc. M.	June 6, 1911	
JONES, GRANDVILLE REYNARD. Chf. Chemist and Asst. Supt., Washington Aqueduct Filtration Plant, Washington, D. C....	Jun.	Jan. 7, 1908	
	Assoc. M.	May 2, 1911	
KELLER, ARTHUR RIFONT. Prof. of Civ. Eng., Coll. of Hawaii, Honolulu, Hawaii.....		June 6, 1911	
KERN, JOSEPH FRANCIS. 716 Decatur St., Brooklyn, N. Y.		April 4, 1911	
KLYCE, BATTLE HARGROVE. Box 240, Americus, Ga.....		June 30, 1911	
KUEHNLE, WILLIAM LOUIS. U. S. Junior Engr., Room 710, Army Bldg., New York City.....		June 6, 1911	
MACKALL, JOHN NATHANIEL. Chf. Draftsman, State Roads Comm. of Maryland, Balti- more, Md.....	Jun.	Aug. 31, 1909	
	Assoc. M.	June 30, 1911	
MACREDIE, JOHN ROBERT CLARKE. Asst. Engr. in Chg. of Viaduct, Canadian Pacific Ry., Box 72, Outlook, Sask., Canada.....		Feb. 28, 1911	
MCCLURE, GUY VINCENT. City Engr., 800 Insurance Bldg., Oklahoma City, Okla.....		April 4, 1911	
MCDERMITH, ORO. Asst. Engr., U. S. Reclamation Service, Newell, S. Dak.....		June 6, 1911	
MCGLATHERY, SAM LYON. Asst. Engr., Bureau of Public Works, Manila, Philippine Islands.....		Feb. 28, 1911	
MERRIMAN, FRED KNIGHTS. Instr., Civ. Eng. Dept., Cath- olic Univ. of America, Washington, D. C.....		June 30, 1911	
MILES, GEORGE FREDERICK. Cons. Efficiency Engr., 108 Worth St., New York City.....		June 30, 1911	
MOODY, CLARE JOSEPH. Asst. Engr., U. S. Reclamation Service, Ronan, Mont.....		June 6, 1911	

ASSOCIATE MEMBERS (*Continued*)

		Date of Membership.
NICHOL, HENRY SCHELL. Asst. Engr., Cana- dian Collieries, Ltd., Victoria, B. C., Canada.....	Jun. } Assoc. M.	Jan. 2, 1906 June 6, 1911
O'HARA, FRANCIS JOSEPH. Asst. Engr., S. P. R. R., Wam- pus, Ore.....		June 6, 1911
PACKARD, DANIEL BERRY. City Engr., Washington, N. C.		June 6, 1911
REINHARDT, JACOB BRUNN. Res. Engr., N. Y. C. R. R., 110 Shepard St., Rochester, N. Y.....		May 2, 1911
RIGGS, CHARLES ALBERT. Chf. Draftsman, J. A. Stewart and Cin. Union Depot & Terminal Co., 540 East 3d St., Newport, Ky.....		June 6, 1911
ROAKE, STEPHEN ALLEN. Asst. Engr., Am. Bridge Co., 105 North Gouverneur Ave., Trenton, N. J.....		June 6, 1911
ROBSON, FREDERICK THURSTON. Cons. and Superv. Engr. (Sloan & Robson), 802 Nevada Bank Bldg., San Francisco, Cal.....		June 6, 1911
SCHIEDENHELM, FREDERICK WILLIAM. Cons. Engr. for James B. Hogg, 801 Second National Bank Bldg., Connellsville, Pa.....		June 6, 1911
SEAMAN, WILLIAM HENRY. County Supt. of Highways, Nassau County, Glen Cove, N. Y.....		June 6, 1911
SHAFER, JAMES CHARLES FORSYTHE. Res. } Engr. for Truesdell-Fox Co. of New } York City, Hadlock, Wash.....	Jun. } Assoc. M.	Oct. 6, 1908 May 2, 1911
SHEMA, JOSEPH. Insp. of Bridges, B. & O. R. R., B. & O. Station, Room 326, Wheeling, W. Va.....	Jun. } Assoc. M.	Oct. 3, 1905 June 6, 1911
SHEPPERD, THOMAS SHACKELFORD. Cons. and Contr. Engr., Littleton, Colo.....		June 30, 1911
SHOEMAKER, JOHN EARL. Designing and Constr. Engr., Pueblo-Rocky Ford Irrig. Co., 601 North Main St., Pueblo, Colo.....		June 6, 1911
SKORNIAKOFF, EUGENE EUGENIEVICH. Dept. of Irrig., Min- istry of Agriculture, St. Petersburg, Russia.....		May 2, 1911
SMITH, EDWARD ST. CLAIR. City Engr., Gooding, Idaho...		Dec. 6, 1910
SMITH, WILLIAM BEAUVAIS, JR. U. S. Junior Engr., U. S. Engr. Office, Custom House, New Orleans, La.....		June 30, 1911
SQUIRE, HARRY EDWIN. Engr. for Erickson } Constr. Co., 924 Highland Ave., Brem- } erton, Wash.....	Jun. } Assoc. M.	Jan. 3, 1907 June 6, 1911
STEGNER, CLIFFORD MILTON. Engr., Dept. of Bldgs., City Hall, Cincinnati, Ohio.....		May 2, 1911
STELLHORN, ADOLF. Civ. Engr., War Dept., U. S. A., 1312 South 2d St., Leavenworth, Kans.....		May 2, 1911

ASSOCIATE MEMBERS (*Continued*)

	Date of Membership.
STEPHENS, ALLEN WHITMORE. Designing Engr., Turner Constr. Co., 8 Birchwood Ave., East Orange, N. J.	June 6, 1911
SULLIVAN, VERNON LYLE. Buenavista, Tex.	June 6, 1911
SWANITZ, HENRY WADE. 1390 Seventh Ave., San Francisco, Cal.	May 2, 1911
THROOP, HENRY GROSVENOR. Engr. of Constr. and Record, Oneida Ry. Co., Utica & Mohawk Val. Ry. Co., and Syracuse Rapid Transit Ry. Co., 1608 South Geddes St., Syracuse, N. Y.	June 30, 1911
VAN DUZER, WILLIAM ALBIE. Res. Engr., Pitts. & Shaw. R. R., R. D. No. 5, New Bethlehem, Pa.	June 30, 1911
VAN HAGAN, LESLIE FLANDERS. Room 304, Engineering Bldg., Univ. of Wisconsin, Madison, Wis.	June 6, 1911
WALL, GEORGE ALBERT. Asst. Engr., C. P. I. D., Bassano, Alta., Canada.	Jan. 3, 1911
WEIGMANN, WILLIAM JULIUS. Asst. Engr., New York State Barge Canal, 4 Elmer Ave., Schenectady, N. Y.	June 30, 1911
WESTON, FREDERICK SAMPSON. Middleboro, } Jun. Oct. 5, 1909 Mass. { Assoc. M.	June 6, 1911
WHITTET, RUFUS MASON. Asst. Engr., Massachusetts State Board of Health, Room 141, State House, Boston, Mass.	May 2, 1911
WICKHAM, HARRY ROGERS. Asst. Engr., Dept. State Engr. and Surv., Chg., Contract 23, 19 Meigs St., Rochester, N. Y.	June 6, 1911
WILLIAMS, JAMES HENRY. Supt. of Dam and Water Supply Work, Ft. Meade, S. Dak.	June 6, 1911
WILSON, HANSON ZIMRI. Engr., Standard Oil Co., 29 Broadway, Room 1700, New York City.	June 30, 1911
WILSON, ROBERT BROWN MURPHY. Engr., M. of W., Ferrocarril Sud-Pacífico de Mexico, Ferrocarril de Sonora, Empalme, Sonora, Mexico.	June 30, 1911
WRIGHT, OTIS HORD. Asst. Engr., Water Board, 452 Ainsworth Ave., Portland, Ore.	May 2, 1911

ASSOCIATES

BROWN, WILLIAM ALDEN. Mgr., Mfg. Dept., Burham Portland Cement Works, Burham, Kent, England.	May 2, 1911
DILWORTH, EDWARD COE. 5806 Howe St., Pittsburg, Pa.	June 6, 1911
MORAN, ROBERT BRECK. 519 California St., San Francisco, Cal.	Jun. Sept. 1, 1908
PRICE, CHARLES PEARL. Mgr., American Tar Co., 201 Devonshire St., Boston, Mass.	June 6, 1911
	May 2, 1911

JUNIORS		Date of Membership.
ALLAIRE, DOUGLAS ANTHONY. 2265 Eighty-fourth St., Brooklyn, N. Y.....		June 30, 1911
BEALL, PENDLETON. 20 Cannon St., Poughkeepsie, N. Y....		June 6, 1911
BRANN, EMMETT RAYMOND. Care, The Texas Co., Tulsa, Okla.....		Dec. 6, 1910
BRINGHURST, JOHN HENRY. 3402 Milam St., Houston, Tex.....		Jan. 3, 1911
DAVIS, DANIEL ELIAS. Asst. City Engr., Alliance, Ohio.		Feb. 28, 1911
ESTES, LEWIS ALDEN. Asst. of Mgr., Foreign Trade Dept., The Trussed Concrete Steel Co., Detroit, Mich.....		June 30, 1911
GATES, WARREN AUSTIN. Structural Engr., Leighton & Smith, 701 Majestic Bldg., Oklahoma City, Okla....		June 30, 1911
HALSTEAD, GEORGE ELIAS. Asst. Engr., Kentucky & Indiana Terminal R. R., 2019 Ekin Ave., New Al- bany, Ind.....		June 30, 1911
HAVENS, WILLIAM WESTERFIELD. 469 East 134th St., New York City.....		Dec. 6, 1910
HUBBARD, DANIEL. 1407 Mt. Royal Ave., Baltimore, Md.		Dec. 6, 1910
HUGHES, NORMAN. 345 Arcade Bldg., Norfolk, Va.....		Dec. 6, 1910
HUTCHINS, EVERETT NELSON. Care, Board of Water Sup- ply, High Falls, N. Y.....		Jan. 31, 1911
JOHNSON, FRANK MELVIN. 1303 East Marion St., Seattle, Wash.....		Jan. 31, 1911
MACY, FRANK HENRY. Care, State Water Supply Comm., Albany, N. Y.....		Jan. 3, 1911
MCCAFFREY, JOHN WILLIAM. Draftsman, Taft-Peirce Mfg. Co., 17 Spring St., Woonsocket, R. I.....		Jan. 31, 1911
McKEAN, HARRY PARKER. Res. Engr. and Mgr., The Otero Irrig. Dist., 3 McNeen Bldg., La Junta, Colo.....		June 6, 1911
MENEFEE, FERDINAND NORTHROP. Bend, Ore.....		June 30, 1911
PAGE, STEPHEN EUGENE. Box 21, Perth Amboy, N. J....		June 30, 1911
PAYNE, JAMES ELWOOD. Dist. Engr., New York Office, Corrugated Bar Co., 17 Battery Pl., New York City.		June 6, 1911
SMITH, GEORGE WASHINGTON. Care, Supt. of Bldg. Constr., Canadian Pacific Ry., Montreal, Que., Canada.....		Jan. 31, 1911
SNYDER, HUBERT EARL. Concrete Foreman, Isthmian Canal Comm., Gatun, Canal Zone, Panama.....		May 2, 1911
SPENGLER, JOHN HENRY. 2347 Fifteenth St., Troy, N. Y.		June 6, 1911
TROWBRIDGE, DOUGLAS STANLEY. Instr. in Eng., New York Univ., Box 75, University Heights, New York City.		April 4, 1911
VANDEVANTER, ELLIOTT. Engr. in Chg., Cost Keeping, Claiborne, Johnston & Co., 901 Calvert Bldg., Balti- more, Md.....		June 6, 1911
WARD, ROY ELSÉN. Box 427, Massena, N. Y.....		May 2, 1911

JUNIORS (Continued)		Date of Membership.
WHEATCROFT, HENRY BELCHER, JR. 438 West 57th St., New York City.....		June 6, 1911
WHITMAN, WILLIAM SATTERWHITE. Care, Chf. Engr., L. & N. R. R., Louisville, Ky.....		May 2, 1911
YOUNG, OLIVER EARLE. U. S. Junior Engr., R. F. D. No. 1, Lincoln, Ala.....		June 6, 1911

CHANGES OF ADDRESS

MEMBERS

- ALLEN, ANDREWS. Cons. and Contr. Engr. (Allen & Garcia), McCormick Bldg., Chicago, Ill.
- EVERY, FREDERICK HAGUE. 1452 Winona Ave., Chicago, Ill.
- AYCRIGG, WILLIAM ANDERSON. Cons. Engr., 11 River Bend Pl., New London, Conn.
- BAKENHUS, REUBEN EDWIN. Civ. Engr., U. S. N., Care, W. F. Rogers, Loan and Trust Bldg., Washington, D. C.
- BARNES, MORTIMER GRANT. Cons. Designing and Const. Engr., 388 Western Ave., Albany, N. Y.
- BEHREND, BERNARD ARTHUR. 200 Devonshire St., Boston, Mass.
- BILLINGS, ASA WHITE KENNEY. Care, Dr. F. S. Pearson, 25 Broad St., New York City.
- BISSELL, HEZEKIAH. Altadena, Cal.
- BOLTON, REGINALD PELHAM. Cons. Engr., 55 Liberty St., New York City.
- BONZANO, MAXIMILIAN FERDINAND. Care, Union League Club, Philadelphia, Pa.
- BROWN, EARL IVAN. Capt., Corps of Engrs., U. S. A., U. S. Engr. Office, Galveston, Tex.
- BROWN, WILLIAM GERIE. Cons. Engr., Clifton, Ore.
- BURGESS, HARRY. Maj., Corps of Engrs., U. S. A., Metropolitan Bank Bldg., New Orleans, La.
- BYAM, LE ROY HENRY. Secy. and Treas., The Elliot C. Brown Co., 27 William St., Room 1807, New York City (Res., Edgecliff Terrace, Park Hill, Yonkers, N. Y.).
- BYERS, MORTON LEWIS. Chf. Engr., M. of W., Mo. Pac. System, 535 Clara Ave., St. Louis, Mo.
- CANTINE, EDWARD IKE. Engr. and Contr., 406 Railway Exchange, Portland, Ore.
- CHAMBERLAIN, PHILLIP WILLIAM. Toro Amarillo P. O., Costa Rica.
- COLE, JOHN ADAMS. Cons. Engr., 1346 East 53d St., Chicago, Ill.
- CORTHELL, ARTHUR BATEMAN. Chf. Engr., B. & M. R. R., Boston, Mass.
- COWLES, WALTER LINSLEY. 309 Ontario St., Oak Park, Ill.
- CREUZBAUR, ROBERT WALTER. Cons. Engr., 30 Church St., New York City.
- CRIDER, JAMES LELAND. Chf. Engr., N. Y., Westchester & Boston Ry. Co.; Chf. Engr., Westchester Northern R. R. Co., 70 East 45th St., Room 3144, New York City.

MEMBERS (*Continued*)

- CROCKER, HERBERT SAMUEL. Cons. Engr., 308 Tramway Bldg., Denver, Colo.
CUMMINGS, WILLIAM WARREN. Cons. and Const. Engr., Hanover, N. H.
DARRACH, CHARLES GOBRECHT. 4144 Poplar St., Philadelphia, Pa.
DAVIS, CHARLES STRATTON. 34 West 44th St., New York City.
DEAN, LUTHER. 2525 Durant Ave., Berkeley, Cal.
DENNIS, ARTHUR CRISFIELD. Mgr., Foley Bros., Welch & Stewart, 202 Chambers of Commerce, Winnipeg, Man., Canada.
ELY, THEODORE NEWEL. Bryn Mawr, Pa.
EVANS, LOUIS HYDE. Cons. Engr., Room 1335, Peoples Gas Bldg., Chicago, Ill.
FAUNTLEROY, JAMES DEARING. Care, U. S. Reclamation Service, Elephant Butte, N. Mex.
FIELD, GEORGE RUSSELL. Care, Claremont Country Club, Oakland, Cal.
FLOESCH, JACOB MARTIN. Cons. Engr. and Contr., 515 German Insurance Bldg., Rochester, N. Y.
FRITCH, LOUIS CHARLTON. 5119 Kimbark Ave., Chicago, Ill.
GOODRICH, ERNEST PAYSON. Cons. Engr., 35 Nassau St., New York City.
GOODWIN, JAMES BOWMAN. Chf. Field Engr. and Supt., Constr., Mount Hood Ry. & Power Co., 439 East 12th St., North, Portland, Ore.
GREGORY, JOHN HERBERT. (Rudolph Hering & John H. Gregory, Cons. Engrs.), 170 Broadway, New York City.
HAINES, HENRY STEVENS. Stanmore House, Burlington Pl., Eastbourne, England.
HARBY, ISAAC. Chf. Engr., Sage Foundation Homes Co., Forest Hills, N. Y.
HARDY, HARRY. San José, Costa Rica.
HARLOW, GEORGE RICHARDSON. Secy and Treas., The James H. Harlow Co., Lutherville, Md.
HARTS, WILLIAM WRIGHT. Maj., Corps of Engrs., U. S. A., War College, Washington Barracks, Washington, D. C.
HAYT, STEPHEN THURSTON, JR. Chf. Engr., Susq. & N. Y. R. R. Co., 849 Louisa St., Williamsport, Pa.
HEPBURN, FREDERICK TAYLOR. Care, H. D. Walbridge & Co., 7 Wall St., New York City.
HINDES, STETSON GEORGE. Pres., Atlantic, Gulf & Pacific Co., and San Francisco Bridge Co., 865 Monadnock Bldg., San Francisco, Cal.
HOLBROOK, FRANK DUDLEY. U. S. Asst. Engr., U. S. Engr. Office, New Martinsville, W. Va.
HOLGATE, HENRY. Cons. Engr., 9 Victoria Sq., Montreal, Que., Canada.
HORN, FRANK CHURCHILL. Cons. Engr., Suite 516, Empire Bldg., Boise, Idaho.
HORNSBY, ROBERT WRIGHT. Care, George Hornsby, 45 Church St., Edge-ware Rd., London, England.
HOWE, EDWARD WILLARD. Asst. Engr., Eng. Dept., 62 City Hall, Boston, Mass.
HOWE, WILLIAM BELL WHITE. Hendersonville, N. C.

MEMBERS (*Continued*)

- JACKSON, WILLIAM BENJAMIN. (D. C. & Wm. B. Jackson, Cons. Engrs.), Harris Trust Bldg., Chicago, Ill.
- JAMES, WILLIAM ATLEE. Div. Engr. of Constr., Canadian Pacific Ry., 151 Lenore St., Winnipeg, Man., Canada.
- KELLEY, WILLIAM DATUS. Pres., Kelly & Kelley (Inc.), Engrs., Builders, and Contrs.; Pres., Cowden & De Young, Inc., Elec. Contrs., 12th St. and Vernon Ave., Long Island City, N. Y.
- KELSEY, LOUIS CURTIS. Cons. Engr., P. O. Box 305, Portland, Ore.
- KNOBLOCH, WALSTAN EMILE. U. S. Asst. Engr., Third Floor, Metropolitan Bank Bldg., New Orleans, La.
- KUTZ, CHARLES WILLAUER. Maj., Corps of Engrs. U. S. A., Manila, Philippine Islands.
- LAHMER, JOHN ALOYSIUS. 3010 East 7th St., Kansas City, Mo.
- LANT, FRANK PARSONS. 135 Broadway, Room 1416, New York City.
- LAWRENCE, EDGAR HEISLER. Care, Marshall & Fox, First National Bank Bldg., Chicago, Ill.
- LOCKWOOD, WILLARD DATUS. 37 West 39th St., New York City.
- MACALLISTER, DICKINSON. Fort Hunter P. O., Pa.
- MARTIN, KINGSLEY LEVERICH. Vice-Pres., The Foundation Co., 115 Broadway, New York City (Res., 25 N. Parsons Ave., Flushing, N. Y.).
- MATHEWSON, THOMAS KNIGHT. Chf. Engr., The Michoacán Power Co., Panindicuaro, Distrito de Puruándiro, Michoacán, Mexico.
- MEEM, JAMES COWAN. Engr. for Frederick L. Cranford, 177 Montague St., Brooklyn, N. Y.
- MILES, JOHN WILEY. Locating Engr., Ferrocarriles Nacionales de Mexico, Pantepec, Puebla, Mexico.
- MOLITOR, FREDERIC. Cons. Engr., 35 Nassau St., New York City.
- MORRIS, HENRY GURNEY. Engr. and Machinist, Commonwealth Trust Bldg., Philadelphia, Pa.
- MURPHY, EDWARD CHARLES. Engr., U. S. Geological Survey, R. F. D. No. 1, Napa, Cal.
- PEARL, WALTER. Cons. Engr., 2046 Walton St., Denver, Colo.
- PENFIELD, WILLIAM HENRY. Asst. Chf. Engr., C., M. & St. P. Ry. Co., 1345 Railway Exchange, Chicago, Ill.
- PERKINS, CHARLES PENROSE. Rosemont, Pa.
- POWERS, CORNELIUS VAN VORST. Div. Engr., Public Service Comm. for the First Dist., 103 East 125th St., New York City.
- RAMSEY, JOSEPH, JR. 42 Broadway, New York City (Res., 157 Raymond Ave., South Orange, N. J.).
- RATHMAN, LOUIS HENRY. Asst. Engr., Bureau of Eng., Dept. of Public Works; Engr. in Chg., City Survey Div. (Res., 172 Cleveland Ave.), Buffalo, N. Y.
- REA, SAMUEL. First Vice-Pres., P. R. R. Co., 225 Broad St. Station, Philadelphia, Pa.
- ROBERTS, SHELBY SAUFLEY. Div. Engr. of Constr., Ill. Cent. R. R. Co., 1 Park Row, Room 706, Chicago, Ill.

MEMBERS (*Continued*)

- ROBINSON, JOHN MASON. Asst. Chf. Engr., Madeira-Mamoré Ry., Manãos, Brazil.
- SHROEDER, CHRISTOFFER. With Haskell & Barker Car Co., Michigan City, Ind. (Res., 6509 LaFayette Ave., Chicago, Ill.).
- SCHUBERT, FREDERICK CELESTINE. U. S. Asst. Engr., Dalles-Celilo Canal, Care, U. S. Engrs., 802 Conch Bldg., Portland, Ore.
- SEUROT, PAUL ALBERT. 199 North Grove St., East Orange, N. J.
- SHAND, JAMES. 1st Capuchinas 31, Mexico, D. F., Mexico.
- SHEPHERD, FRANK CUMMINGS. With James Stewart & Co., 30 Church St., New York City.
- SMITH, JOHN HERMAN. Engr., Idaho Northern Ry., Nampa, Idaho.
- SMITH, LAYTON FONTAINE. Representative, Trussed Concrete Steel Co. of Detroit, Mich., 513 North Charles St. (Res., 2901 Calvert St.), Baltimore, Md.
- SMITH, WILLIS ROSWELL. Res. Engr., The Arnold Co., Sultan, Wash.
- SNOW, JONATHAN PARKER. 58 Chandler St., West Somerville, Mass.
- STEECE, EMMET ABNER. Supt. of Constr., U. S. Public Bldgs., Greenwood, Miss.
- SUHR, OTTO BRUNO. 808 Third St., Santa Monica, Cal.
- TAYLOR, HARRY. Lt.-Col., Corps of Engrs., U. S. A., Office, Chf. of Engrs., Washington, D. C.
- TIGHE, JAMES LAWRENCE. Cons. Engr., 189 High St., Holyoke, Mass.
- TUTHILL, JOB. Engr., Bldgs., Kansas City Terminal Ry., Kansas City, Mo.
- VAN NORDEN, RUDOLPH WARNER. Cons. Engr., 517 Nevada Bank Bldg., San Francisco, Cal.
- WADSWORTH, HENRY HAYES. Room 410, U. S. Custom House, San Francisco, Cal.
- WALLACE, JOHN FINDLEY. Pres., Westinghouse, Church, Kerr & Co.; Pres., Electric Properties Co., 165 Broadway, New York City.
- WARD, THOMAS MONROE. Care, Mrs. E. A. Lewis, Fort Missoula, Missoula, Mont.
- WARE, JOHN. Asst. Treas., Port Neuf Development Co., Downey, Idaho.
- WARRINGTON, HARRY ESMOND. 1486 West 8th St., Riverside, Cal.
- WEBER, ALEXANDER HAMILTON. U. S. Asst. Engr., 735 Southern Bldg., Washington, D. C.
- WHITFORD, REID. Secy. and Engr., San. and Drainage Comm., Charleston County, 174 Rutledge Ave., Charleston, S. C.
- WHITNEY, FRANK ORMOND. Chf. Engr., Street Laying Out Dept., 100 Summer St., Boston, Mass.
- WILKINSON, THOMAS LEE. Cons. Mech. Engr., 406 Boston Bldg., Denver, Colo.
- WOOD, EDWARD NATHAN. 331 La Salle St., Room 10, Chicago, Ill.
- WOOTEN, WILLIAM PRESTON. Maj., Corps of Engrs., U. S. A., U. S. Engr. Office, Honolulu, Hawaii.
- WRIGHT, JOSEPH. Engr., U. S. Reclamation Service, Babb, Mont.

ASSOCIATE MEMBERS

- ADAMS, ARTHUR. Cons. Engr., P. O. Box 17, Halifax, N. S., Canada.
- AMBURN, WILLIAM WESLEY. 265 Eighty-sixth St., Montavilla Sta., Portland, Ore.
- ANDREW, CLARENCE RAYMOND. New Martinsville, W. Va.
- ARRINGTON, JOHN. 719 Continental Bank Bldg., Chicago, Ill.
- BARTOCCINI, ASTOLFO. 261 Broadway, New York City.
- BARTON, WALTER CHEW. U. S. Engr. Office, Third Floor, Metropolitan Bank Bldg., New Orleans, La.
- BEALE, CARROLL. Contr. Engr., Pittsburgh Steel Co., Singer Bldg., New York City.
- BEEBE, HENRY RUMRILL. Commr. of Public Works, 15 Avery Pl., Utica, N. Y.
- BENNETT, CHARLES NOBLE. 1018 Board of Trade Bldg., Portland, Ore.
- BERRY, LESLIE GRAHAM. Mgr., Southern Eng. Co., Charlotte, N. C.
- BOARDMAN, HOWARD EDWARD. Div. Engr., Mo. Pac. Ry., Atchison, Kans.
- BREED, HENRY ELTINGE. Seaford, Del.
- BROWN, BURTIS SCOTT. Structural Engr., 88 Broad St., Boston, Mass.
- BROWNLEE, JAMES LAWRENCE. P. O. Drawer 7, The Dalles, Ore.
- BRUNING, HENRY DIEDRICH. 2401 Neil Ave., Columbus, Ohio.
- BRUSH, CARL FLETCHER. Lakeland, Fla.
- BUNKER, STEPHEN SANS. P. O. Box 404, Billings, Mont.
- BURGOYNE, JOHN HENRY, JR. Locating Engr., Oroya-Chanchamayo R. R., Oroya, Peru.
- BUTLER, MILLARD ANGLE. 912 East Sinto Ave., Spokane, Wash.
- BUTZ, GEORGE WISHART. Res. Engr., The Western Maryland Ry. Co., Ohio Pyle, Pa.
- CARR, DEAN ORRICE. 667 Harrison St., Gary, Ind.
- CARROLL, CHARLES JOSEPH. Care, Parker & Carroll, Apartado No. 208, Durango, Mexico.
- CILLEY, MORGAN. 1518 Seventy-sixth St., Brooklyn, N. Y.
- CLAPP, GEORGE HUBBARD. Pres., Pittsburgh Testing Laboratory, Cor., 7th and Bedford Avenues, Pittsburg, Pa.
- CLEAVER, PITSON JAY. Pacific City, Wash.
- COLE, BURT. 339 Hawthorne Ave., Webster Groves, Mo.
- COLLINS, FRANK JOSEPH. Supt. for James Stewart & Co., 284 Alexander St., Rochester, N. Y.
- COLLINS, JOHN T. Puerto Plata, Dominica.
- COLVIN, DONALD DEAN. Engr., M. of W., Ferrocarriles Nacionales de Mexico, Colonia Station, Mexico, D. F., Mexico.
- CONNOR, RALPH MELVIN. Care, U. S. Reclamation Service, Helena, Mont.
- CUNNINGHAM, JOHN GEORGE LAWRENCE. Box 14, Matamoros, Tamaulipas, Mexico.
- DANIELS, THOMAS REMINGTON HOLDEN. Birmingham Ry., Light & Power Co., Birmingham, Ala.
- DAVENPORT, JAMES WATSON. 40 Montgomery St., Memphis, Tenn.

ASSOCIATE MEMBERS (*Continued*).

- DAVIS, FRED RUFUS. Insp., Associated Factory Mutual Fire Ins. Co., 810 Denckla Bldg., Philadelphia, Pa.
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- EBASHI, TEIJI. Care, Waddell & Harrington, 1012 Baltimore Ave., Kansas City, Mo.
- EDWARDS, HAROLD. 289 Garry St., Winnipeg, Man., Canada.
- EDWARDS, LLEWELLYN NATHANIEL. P. O. Box 762, Montreal, Que., Canada.
- ELY, JOHN ANDREWS. Care, Brown, Shipley & Co., Pall Mall, London, S. W., England.
- ENSEY, RICHARD FAHNESTOCK. P. O. Box 515, Fort Lauderdale, Fla.
- FARWELL, CARROLL ANDREW. Riomedina, Tex.
- FIFIELD, RALPH HERBERT. Care, U. S. Reclamation Service, Williston, N. Dak.
- FORD, ROBERT HENRY PERSSE. Care, Hodges-Downey Constr. Co., Pierce Bldg., St. Louis, Mo.
- FOX, WALTER GORDON. Locating Engr., National R. R. of Haiti, Care, American Legation, Port-au-Prince, Haiti.
- FREEMAN, ARTHUR CLARICO, JR. 343 Arcade Bldg., Norfolk, Va.
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- GRIFFIN, JOHN ALEXANDER. Norcross, Ga.
- GRIFFITH, JOHN HOWELL. Engr.-Physicist, U. S. Bureau of Standards, Pittsburg, Pa.
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- HAMILL, WILLIAM SAMUEL. Gen. Mgr., William S. Hamill Co., 18 State St., Troy, N. Y.
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DEATHS

- BRIGGS, ROSWELL EMMONS. Elected Member, September 15th, 1869; died May 4th, 1911.
- HADSALL, JOSEPH CANBY. Elected Associate Member, November 8th, 1909; died June 29th, 1911.
- HAGUE, CHARLES ARTHUR. Elected Member, February 3d, 1892; died June 25th, 1911.
- KENLY, EDWARD MARION. Elected Member, May 4th, 1904; died June 10th, 1911.
- LEWERENZ, ALFRED COURTNEY. Elected Junior, March 5th, 1895; Associate Member, June 6th, 1900; Member, March 6th, 1906; died May 27th, 1911.
- MCGRATH, WALLACE. Elected Member, September 5th, 1883; died December 5th, 1909.
- NORTH, EDWARD P. Elected Member, December 4th, 1867; died July 20th, 1911.
- PATCH, HOMER AUSTIN. Elected Associate Member, January 8th, 1908; died April 4th, 1911.
- SEARS, ALFRED FRANCIS. Elected Member, June 2d, 1869; died June 7th, 1911.
- WOLKOWYSKI, ALEXANDER ILICH. Elected Junior, January 7th, 1908; died September 27th, 1910.
- WOOD, CHARLES WIDNEY. Elected Member, October 7th, 1908; died April 3d, 1911.

Total Membership of the Society, August 1st, 1911,

6 129.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(May 6th to August 1st, 1911)

NOTE.—This list is published for the purpose of placing before the members of the Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

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| (1) <i>Journal, Assoc. Eng. Soc.</i> , 31 Milk St., Boston, Mass., 30c. | (28) <i>Journal, New England Water-Works Assoc.</i> , Boston, Mass., \$1. |
| (2) <i>Proceedings, Engrs. Club of Phila.</i> , 1317 Spruce St., Philadelphia, Pa. | (29) <i>Journal, Royal Society of Arts</i> , London, England, 15c. |
| (3) <i>Journal, Franklin Inst.</i> , Philadelphia, Pa., 50c. | (30) <i>Annales des Travaux Publics de Belgique</i> , Brussels, Belgium. |
| (4) <i>Journal, Western Soc. of Engrs.</i> , Monadnock Blk., Chicago, Ill. | (31) <i>Annales de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand</i> , Brussels, Belgium. |
| (5) <i>Transactions, Can. Soc. C. E.</i> , Montreal, Que., Canada. | (32) <i>Mémoires et Compte Rendu des Travaux, Soc. Ing. Civ. de France</i> , Paris, France. |
| (6) <i>School of Mines Quarterly</i> , Columbia Univ., New York City, 50c. | (33) <i>Le Génie Civil</i> , Paris, France. |
| (8) <i>Stevens Institute Indicator</i> , Stevens Inst., Hoboken, N. J., 50c. | (34) <i>Portefeuille Economiques des Machines</i> , Paris, France. |
| (9) <i>Engineering Magazine</i> , New York City, 25c. | (35) <i>Nouvelles Annales de la Construction</i> , Paris, France. |
| (10) <i>Cassier's Magazine</i> , New York City, 25c. | (37) <i>Revue de Mécanique</i> , Paris, France. |
| (11) <i>Engineering</i> (London), W. H. Wiley, New York City, 25c. | (38) <i>Revue Générale des Chemins de Fer et des Tramways</i> , Paris, France. |
| (12) <i>The Engineer</i> (London), International News Co., New York City, 35c. | (41) <i>Modern Machinery</i> , Chicago, Ill., 10c. |
| (13) <i>Engineering News</i> , New York City, 15c. | (42) <i>Proceedings, Am. Inst. Elec. Engrs.</i> , New York City, 50c. |
| (14) <i>The Engineering Record</i> , New York City, 12c. | (43) <i>Annales des Ponts et Chaussées</i> , Paris, France. |
| (15) <i>Railway Age Gazette</i> , New York City, 15c. | (44) <i>Journal, Military Service Institution, Governors Island</i> , New York Harbor, 50c. |
| (16) <i>Engineering and Mining Journal</i> , New York City, 15c. | (45) <i>Mines and Minerals</i> , Scranton, Pa., 20c. |
| (17) <i>Electric Railway Journal</i> , New York City, 10c. | (46) <i>Scientific American</i> , New York City, 8c. |
| (18) <i>Railway and Engineering Review</i> , Chicago, Ill., 10c. | (47) <i>Mechanical Engineer</i> , Manchester, England. |
| (19) <i>Scientific American Supplement</i> , New York City, 10c. | (48) <i>Zeitschrift, Verein Deutscher Ingenieure</i> , Berlin, Germany. |
| (20) <i>Iron Age</i> , New York City, 10c. | (49) <i>Zeitschrift für Bauwesen</i> , Berlin, Germany. |
| (21) <i>Railway Engineer</i> , London, England, 25c. | (50) <i>Stahl und Eisen</i> , Düsseldorf, Germany. |
| (22) <i>Iron and Coal Trades Review</i> , London, England, 25c. | (51) <i>Deutsche Bauzeitung</i> , Berlin, Germany. |
| (23) <i>Bulletin, American Iron and Steel Assoc.</i> , Philadelphia, Pa. | (52) <i>Rigasche Industrie-Zeitung</i> , Riga, Russia. |
| (24) <i>American Gas Light Journal</i> , New York City, 10c. | (53) <i>Zeitschrift, Oesterreichischer Ingenieur und Architekten Verein</i> , Vienna, Austria. |
| (25) <i>American Engineer</i> , New York City, 20c. | (54) <i>Transactions, Am. Soc. C. E.</i> , New York City, \$4. |
| (26) <i>Electrical Review</i> , London, England. | (55) <i>Transactions, Am. Soc. M. E.</i> , New York City, \$10. |
| (27) <i>Electrical World</i> , New York City, 10c. | (56) <i>Transactions, Am. Inst. Min. Engrs.</i> , New York City, \$5. |

- (57) *Colliery Guardian*, London, England.
 (58) *Proceedings*, Engrs.' Soc. W. Pa., 803 Fulton Bldg., Pittsburg, Pa., 50c.
 (59) *Transactions*, Mining Inst. of Scotland, London and Newcastle-upon-Tyne, England.
 (60) *Municipal Engineering*, Indianapolis, Ind., 25c.
 (61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
 (62) *Industrial World*, 59 Ninth St., Pittsburg, Pa.
 (63) *Minutes of Proceedings*, Inst. C. E., London, England.
 (64) *Power*, New York City, 20c.
 (65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
 (66) *Journal of Gas Lighting*, London, England, 15c.
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 (68) *Mining Journal*, London, England.
 (70) *Engineering Review*, New York City, 10c.
 (71) *Journal*, Iron and Steel Inst., London, England.
 (71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
 (73) *Electrician*, London, England, 18c.
 (74) *Transactions*, Inst. of Min. and Metal., London, England.
 (75) *Proceedings*, Inst. of Mech. Engrs., London, England.
 (76) *Brick*, Chicago, Ill., 10c.
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 (78) *Beton und Eisen*, Vienna, Austria.
 (79) *Forscherarbeiten*, Vienna, Austria.
 (80) *Tonindustrie Zeitung*, Berlin, Germany.
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 (83) *Progressive Age*, New York City, 15c.
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 (92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
 (93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
 (94) *The Boiler Maker*, New York City, 10c.
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LIST OF ARTICLES.

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 Salisbury Viaduct, Western Maryland Railway.* (87) May.
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 Some Observations on Recent Bridge Construction in America. Henry S. Jacoby. (Abstract from *Cornell Civil Engineer*.) (13) May 18.
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 Concrete Abutments for Highway Bridges.* H. E. Bilger. (Paper read before the Illinois Soc. of Engrs. and Surv.) (96) June 8; (67) July.
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 A Suspended Flexible Centering for Masonry Arches as Used on the Chickahominy River Bridge, Virginia. Philip Aylett, Assoc. M. Am. Soc. C. E. (13) June 15.
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 The Erection of the Cantilever Arm of the Beaver Bridge.* (14) July 1.
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 Appraisal of the Seattle Telephone Companies by the Railroad Commission of Washington. Henry S. Gray, Assoc. M. Am. Soc. C. E. (86) May 3.
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- The Stone Crushing Plant of the Acton Rock Co., Los Angeles, Cal.* (13) June 8.
- The Traveling Crane in Terminal Freight Handling.* H. McL. Harding. (14) June 10.
- Cupola Practice: American. R. H. Palmer. (Paper read before the Am. Foundrymen's Assoc.) (62) June 12.
- Cupola Practice: British. P. Munnich. (Paper read before the Am. Foundrymen's Assoc.) (62) June 12.
- A New Illinois Structural Mill.* (20) June 15.
- Steel Derricks and Drilling Rigs.* R. B. Woodworth. (Paper read before the Natural Gas Assoc. of America.) (83) June 15.
- Machinery Used for Pumping Natural Gas. E. S. McClelland. (Paper read before the Natural Gas Assoc. of America.) (83) June 15.
- The Tunnel Kiln.* A. V. Bleininger. (76) June 15.
- The Kila Problem. Ellis Lovejoy. (76) June 15.
- Oil Burning Statistics, Report showing Comparative Cost of Burning with Different Fuels and Analysis of Clay Used. (76) June 15.
- Operation of Natural Gas Compressing Stations. James S. Posgate. (Paper read before the Natural Gas Assoc. of America.) (83) June 15.
- Pipe-Molding Machine and Continuous Pipe Foundry at Coshocton, Ohio.* (13) June 15.
- The Design of Cams for High-Speed Motors.* Robert F. McKay. (12) June 16.
- Carbonizing Systems, a Review and a Selection.* P. C. Holmes Hunt. (Paper read before the Inst. of Gas Engrs.) (66) June 20.
- The Use of High-Pressure Gas for Industrial Purposes.* E. W. Smith. (Paper read before the Inst. of Gas Engrs.) (66) June 20.
- Notes on the Corrosion of Service-Pipes (Gas). James M'Leod. (Paper read before the Inst. of Gas Engrs.) (66) June 20.
- The Dessau Vertical Retorts at Sunderland.* Charles Dru Drury. (Paper read before the Inst. of Gas Engrs.) (66) June 20.
- The Scientific Carbonization of Coal. J. G. Newbigging. (Paper read before the Inst. of Gas Engrs.) (66) June 20.
- Auxiliary Oil Firing in Steam Boiler Plants.* H. A. Wagner, M. Am. Inst. E. E. (13) June 22; (47) July 14.
- The Use of Motor Trucks on Construction Work and for Haulage Purposes.* (13) June 22.
- Gary 60-Inch Universal Plate Mill.* (20) June 22.
- Notes on Fuel Economy. C. E. C. Shawfield. (73) June 23.
- Gas Cavities, Shot and Chilled Iron in Iron Castings. Thomas D. West. (Paper read before the Amer. Foundrymen's Assoc.) (11) June 23; (47) June 16.
- An Air Propeller Testing Apparatus, Professor Prandtl's System.* (19) June 24.
- The Gyro-Compass.* (11) June 23.
- International Harvester Tractor Works.* (20) June 29.
- The Tilling Petrol-Electric 'Bus.* (26) June 23.
- The Appraisal of the Madison Gas and Electric Co. (86) June 28.
- The Aeronautical Motor.* E. W. Roberts. (Paper read before the National Gas and Gasoline Engine Trades Assoc.) (96) June 29.
- Titanium for Malleable Iron. C. H. Gale. (Paper read before the Amer. Foundrymen's Assoc.) (47) June 30.
- The New Stone Crushing Plant of the Chicago Union Lime Works.* (67) July.
- Sand-Lime Products.* E. Leduc and Ch. de la Roche. (67) Serial beginning July.
- Specifications for Cast Iron Pulleys.* A. W. Wackerman. (108) July.
- High-Speed Tools and Machines to Fit Them.* H. I. Brackenbury. (75) July.
- Steam Auxiliary to Hydroelectric Installation.* J. W. Fraser. (27) July 1.
- Lubricating Oil. Frederick W. Mann. (Paper read before the Venango Engrs. Club.) (98) July.
- Development of High-Speed Drilling-Machines. L. P. Alford. (75) July.
- Tooth Gearing.* J. D. Steven. (75) July.
- Interchangeable Involute Gearing.* Wilfred Lewis. (75) July.
- Rapid Production in Machine Work.* John Calder. (75) July.
- Data on Manufacturing Methods with Machine Tools.* Luther D. Burlingame. (75) July.

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Mechanical—(Continued).

- The Cincinnati Bickford Shops.* (20) July 6.
 A Comparison of Costs of Power Supply from Low Head Hydraulic Plants and Steam Plants. Arthur H. Ford. (Abstract of paper read before the Iowa Soc. of Engrs.) (96) July 6; (86) June 14.
 Strength of Rawhide Drives. W. H. Diefendorf. (From *American Machinist*.) (47) July 7.
 Gas Engines and Producer Plants for Power Stations.* R. M. Carr. (Abstract of paper read before the Mun. Elec. Assoc.) (47) July 7; (73) June 30.
 Standards of Safety in Relation to Machinery.* David S. Beyer. (20) Serial beginning July 13.
 An Oil Gas Producer.* (20) July 13.
 Producer Gas. W. A. Bone. (Paper read before the West of Scotland Iron and Steel Inst.) (47) July 14.
 Internal-Combustion Engines Working on the Diesel Principle. H. L. Howard. (Abstract of paper read before the Inc. Mun. Elec. Assoc.) (47) July 14; (73) June 30.
 The Works of Messrs. Brown, Boveri and Co., Baden.* (11) July 14.
 The "Stock" Oil-Fired Converter at Darlington Forge.* (11) July 14; (12) July 14.
 An Interesting Isolated Power Plant.* Warren O. Rogers. (64) July 18.
 Steel Castings from Electric Furnace, one Phase of the Roehling-Rodenhauser Induction Furnace.* C. H. Von Baur. (Abstract of paper read before the Amer. Foundrymen's Assoc.) (20) July 20.
 Pouring and Melting Points of some High-Grade Bronzes. C. P. Karr. (Paper read before the Amer. Brass Founders' Assoc.) (47) July 21.
 The Works of Messrs. Sulzer Brothers, Winterthur.* (12) July 21.
 The Works of Messrs. Escher Wyss and Co., Zurich.* (12) July 21.
 The Swiss Locomotive and Engineering Works, Winterthur.* (12) July 21.
 The De Laval Steam Turbine for Driving Low or Moderate Speed Machinery.* (73) July 21.
 Steam Turbo-Generating Station.* (27) July 22.
 A Wire Ropeway for German East Africa, Transporting Lumber in a Jungle.* Frederick C. Coleman. (19) July 29.
 Efficient Drying of Cement Rock, Records of Actual Tests of Equipment at Plants of Pennsylvania Cement Co., Bath, Pa.* (62) July 31.
 The Speed and Power of Machine Tools.* (25) Aug.
 Problems and Progress in Aviation.* William D. Ennis. (9) Aug.
 Test with Oil Fuel. (From *Journal*, Amer. Soc. Naval Engrs.) (64) Aug. 1.
 Richmond's New Municipal Plant.* (64) Aug. 1.
 Progrès de l'Aérodynamique, Expériences et Mesures sur l'Aéroplane en Plein Vol.* J. LeGrand. (32) Mar.
 Note de M. G. Eiffel sur son Ouvrage la Résistance de l'Air et l'Aviation.* (32) Mar.
 Les Moteurs à Combustion Interne et en Particulier le Moteur Diesel.* P. Du Bousquet. (32) Apr.
 Etudes Expérimentales sur les Hélices Propulsives Aériennes. Legrand. (92) Apr.
 Etude de la Combustion dans les Foyers Mécaniques et en Particulier dans le Foyer Savary.* J. Izart. (32) May.
 Les Fours à Gaz à Chambres Horizontales de l'Usine d'Elbeuf (Seine-Inférieure).* Bernard Kraft. (33) May 20.
 Note Relative au Calcul des Disques à Grande Vitesse de Rotation avec Application aux Volants à Voile Plein.* E. Rousseau et E. Biévez. (30) June.
 Déchargement et Transport des Charbons du Port à l'Usine à Gaz de Nice.* G. Birle. (33) June 3.
 Les Mesures Aérodynamiques sur les Aéroplanes de Dimensions Normales.* M. Bousquet. (33) June 10.
 Sur la Transformation d'un Moteur à Vapeur Actionnant un Laminoin à Toles Fines.* Charles Reiglier. (37) June.
 Accouplements pour Arbes de Transmission.* Pierre Blanc. (37) June 30.
 Über den Einfluss des Wasserdampfes und des Strahlungsverlustes der Vergasungszone auf die Vergasung fester Brennstoffe im Gaserzeuger.* Jul. Voigt. (52) Apr. 15.
 Die Spezifische Wärme c_p des überhitzten Wasserdampfes für Drücke von 2 bis 8 kg/qcm und Temperaturen von 350 bis 550° C.* Oscar Knoblauch und Hilde Möller. (48) Apr. 29.
 Ein Versuch zur Erklärung der Rolle der Schlacke in unseren Hüttenprozessen.* Carl Dichmann. (50) Serial beginning May 11.
 Schleifscheiben, ihre Herstellung und Verwendung.* W. Herminghausen. (50) May 25.
 Wirkungsweise und Berechnung der Windkessel von Kolbenpumpen.* Anton Gramberg. (48) Serial beginning May 27.
 Ueber Führungen an neueren Draht- und Feinstrassen.* Fr. Münker. (50) June 1.
 Versuche an einer Generatorgasanlage.* Kurt Neumann. (48) June 3.

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Mechanical—(Continued).

- Neuere Bestrebungen in der Verwendung der Gase in Eisenhütten und Kokerelen. Fritz W. Lüdmann. (50) June 8.
 Die Wärmeausnutzung der heutigen Kolbendampfmaschine.* K. Hellmann. (48) Serial beginning June 10.
 Beiträge zur Berechnung der Zentripital (Francis) Turbinen.* Camerer. (48) Serial beginning June 10.
 Die Torfgewinnungsmaschine Bauart Strenge.* Paulmann und Blaum. (48) June 17.
 Wichtige Fragen aus der Kraftversorgung unserer Hüttenwerke durch Gichtgase.* Hubert Hoff. (50) Serial beginning June 22.
 Neuerungen an Flammöfen, insbesondere an Siemens-Martin-Oefen.* Fr. Bernhardt. (50) July 13.
 Berechnung der Eisenkonstruktion eines Mehrwagen-Kreiselwippers.* (53) Serial beginning July 14.
 Kinematographische Untersuchung eines Dampfhammers.* Otto Fuchs. (48) July 15.

Metallurgical.

- The Combustion-Temperature of Carbon and its Relation to Blast-Furnace Operation.* Clarence P. Linville. (56) Vol. 41.
 The Behavior of Copper Matte and Copper-Nickel Matte in the Bessemer Converter. David H. Browne. (56) Vol. 41.
 Cyanide-Plant and Practice at the Minas del Tajo, Rosario, Sinaloa, Mexico.* George A. Tweedy and Roger L. Beals. (56) Vol. 41.
 Improvement in Cyanide Practice.* E. Gybbon Spillsbury. (56) Vol. 41.
 The Chemical Control of Slimes.* Harrison Everett Ashley. (56) Vol. 41.
 Pyritic Smelting in Leadville. Charles H. Doolittle and Royal P. Jarvis. (56) Vol. 41.
 Tops of Copper Blast-Furnaces.* N. H. Emmons. (56) Vol. 41.
 Recent Progress in Blast-Roasting.* H. O. Hofman. (56) Vol. 41.
 Heats of Formation of Some Ferro-Calcic Silicates. H. O. Hofman and C. Y. Wen. (56) Vol. 41.
 The Reduction of Calcium Sulphate by Carbon Monoxide and Carbon, and the Oxidation of Calcium Sulphide.* H. O. Hofman and W. Mostowitsch. (56) Vol. 41.
 The Behavior of Copper-Slags in the Electric Furnace. Lewis T. Wright. (56) Vol. 41.
 The Girod Electric Furnace and the French Works Using the Paul Girod Steel-Process.* Wilhelm Borchers. (56) Vol. 41.
 The Solid Non-Metallic Impurities in Steel (Sonims). Henry D. Hibbard. (56) Vol. 41.
 Steel Manufacture in an Electric Converter. A. E. Greene. (Abstract of paper read before the Am. Electro-Chemical Soc.) (22) Apr. 28.
 The Electrometallurgical Revolution in the Iron and Steel Industry of Norway and Sweden.* Jos. W. Richards. (58) May.
 Dommeldange Electric Steel Plant.* Alfred Gradenwitz. (16) May 6.
 Roasting at Kalgoorlie.* M. W. von Bernewitz. (103) May 13.
 Improvements in Assaying. Abbot A. Hanks. (Paper read before the Am. Chem. Soc.) (103) May 13.
 Greenwood Copper Smelting Works.* J. E. McAllister. (16) May 20.
 Electrolytic Cyanide Regeneration. J. E. Clennell. (16) May 27.
 Acetylene Welding.* J. M. Morehead. (65) June.
 Strength of Oxyacetylene Welds in Steel.* Herbert L. Whittemore. (From the Wisconsin Engineer.) (108) June.
 Blair's Zinc-Lead Pigment Plant. J. I. Blair. (45) June.
 Electric Furnace for Zinc Smelting.* Francis A. J. FitzGerald. (45) June.
 Vanadium Alloys.* George L. Norris. (3) June.
 Some Causes of Failure in Metals. Henry Fay. (Abstract of paper read before the Mass. Inst. of Tech.) (47) June 2.
 Slime Agitation at Kalgoorlie.* M. W. Von Bernewitz. (103) Serial beginning June 3.
 Ore Reduction in the Harz.* O. H. Hahn. (16) June 3.
 Standards for the Various Kinds of Pig Iron. Fletcher Collins. (20) June 8.
 Amalgamation on the Rand.* W. R. Dowling. (Abstract from the Journal. Chemical, Metallurgical and Mining Soc. of South Africa.) (103) June 10.
 An Improved Electric Steel Furnace.* Alfred Gradenwitz. (19) June 10.
 The Electric Iron Reduction Plant at Trollhättan, Sweden.* J. A. Lefler and E. Odelberg. (Paper read before the Swedish Assoc. of Iron Masters.) (105) July; (11) Serial beginning June 16; (22) June 9.
 Costs at Old Bingham Smelter.* Percy E. Barbour. (16) June 24.
 Specific Gravity Estimation of Pulp.* F. B. Hyder. (45) July.
 The Desiccation of Furnace Air.* (45) July.
 Webb City Lead Smelter.* Lucius L. Wittich. (45) July.

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Metallurgical—(Continued).

- Roasting of Nickel-Copper Matte. Edward F. Kern and H. W. Walter. (6) July.
- Copper Smelting in Michigan.* Henry D. Conant. (6) July.
- The Causes and Prevention of Corrosion of Iron and Steel. Bradley Stoughton. (9) July.
- The New Iroquois Blast Furnaces.* (20) July 6.
- Tonopah-Belmont Cyanide Plant.* Claude T. Rice. (16) July 15.
- The Gronwall Steel Refining Furnace.* T. D. Robertson. (96) July 20.
- Notes on the Metallurgy of Wrought Copper.* F. Johnson. (105) Aug.
- Notes de Métallographie.* H. Le Chatelier. (93) May.
- Etude Micrographique sur la Fragilité des Aciers à l'Ecrasement (Examen des Surfaces de Base de Cylindres Ecrasés à Différentes Températures).* F. Robin. (93) May.
- Appareils pour l'Essai de Dureté des Métaux.* (34) June.
- L'Etat Actuel de la Théorie et de la Pratique de la Cimentation.* Léon Guillet. (33) Serial beginning June 24.
- Recherches sur Quelques Alliages Métalliques Silicés et Contributions à l'Etude des Densités des Alliages.* R. Frilley. (93) July.
- La Desiccation du Vent des Hauts Fourneaux à Differdange (Luxembourg) par le Chlorure de Calcium, Procédé Daubiné et Roy.* E. Lemaire. (33) July 8.
- Oelfeuerungsbetriebe mit besonderer Berücksichtigung der Steinkohlenteeröle für Metallschmelzöfen.* H. Teichmann. (50) Serial beginning May 25.
- Ueber die elektrische Rohenerzeugung auf dem Versuchswerk am Trollhättan.* R. Neumann. (50) June 22.
- Erfahrung in der Elektrostahlerzeugung im Girodofen.* A. Müller. (50) July 20.
- Beiträge zur Ausnutzung der Hochofengase.* (50) July 20.

Military.

- Vickers' Automatic Rifle-Calibre Gun.* (11) Apr. 28.
- The 15-Inch Gun From an Engineer's Point of View. H. J. Jones. (12) May 5.
- Damp Walls: A Study of Causes and Remedies, Deductions from Experience with Modern Seacoast Fortifications.* William Albert Jones. (9) June.

Mining.

- Systematic Exploitation in the Pittsburg Coal-Seam.* F. Z. Schellenberg. (56) Vol. 41.
- Dust-Explosions in Coal-Mines. George S. Rice. (56) Vol. 41.
- Ventilating-System at the Comstock Mines, Nevada.* George J. Young. (56) Vol. 41.
- Electric Mine-Hoists. D. B. Rushmore and K. A. Pauly. (56) Vol. 41.
- Tests of an Igniter Electric Hoist.* R. R. Seeger. (56) Vol. 41.
- Cyanide-Plant and Practice at the Minas del Tajo, Rosaria, Sinaloa, Mexico.* George A. Tweedy and Roger L. Beals. (56) Vol. 41.
- Application of Descriptive Geometry to Mining Problems.* Joseph W. Roe. (56) Vol. 41.
- The Giroux Shaft at Kimberly, Nev.* C. Everard Arnold. (56) Vol. 41.
- The Gold-Fields of French Guiana, and the New Method of Dredging.* Albert F. J. Bordeaux. (56) Vol. 41.
- Recent Developments in the Undercutting of Coal by Machinery.* Edward W. Parker. (56) Vol. 41.
- Development of Hindered-Settling Apparatus.* Robert H. Richards. (56) Vol. 41.
- Gaseous Decomposition-Products of Black-Powder, with Special Reference to the Use of Black Powder in Coal-Mines.* Clinton M. Young. (56) Vol. 41.
- Dry-Washing for Placer-Gold in Sonora, Mexico.* J. V. Richards. (56) Vol. 41.
- Face-Conveyors in Thin Seams, with Special Reference to the Blackett Face-Conveyor. A. E. Booth. (106) Vol. 41, Pt. 2.
- The Fire and Rescue-Station of the Durham and Northumberland Collieries Fire- and Rescue-Brigade.* W. C. Blackett. (106) Vol. 41, Pt. 2.
- The Rescue-Station at the Kleophas Mine, Zalenze, Upper Silesia, Germany. Berent Conrad Gullachsen. (106) Vol. 41, Pt. 2.
- The Equipment of Colliery Workshops.* L. C. Perkin. (106) Vol. 41, Pt. 2.
- The Protection of Electrical Installations in Mines by the Winhey Leakage-Detector.* Eustace E. Baker. (106) Vol. 41, Pt. 2.
- The Advantages of Freezing as a Method of Sinking Through Heavily-Watered or Difficult Ground.* William Brumwell Wilson. (106) Vol. 41, Pt. 3.
- Control of Electric Winding and Hoisting Engines.* E. Rosenberg. (77) Apr.
- Oil Investigations in Illinois.* Raymond S. Blatchley. (4) May.
- Mining and Milling at Trinity Mine.* J. W. Swaren. (16) May 6.
- Operation of the Goldfield Consolidated Mill.* J. W. Hutchinson. (103) Serial beginning May 6.
- Electrically Driven Turbine Sinking Pumps for Mines.* E. W. Jansen. (27) May 11.

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Mining—(Continued).

- The St. Eugene Mines. E. P. Cowles. (96) May 11.
 Coal Cutting.* H. J. Fisher. (73) May 12.
 Underground Colliery Wiring.* A. B. Mallinson, A. M. I. E. E. (73) May 12.
 Collieries and Power Supply.* (73) May 12.
 Recent Electric Power Developments in North Staffordshire Collieries.* (73) May 12.
 Electric Winding for Collieries.* (73) May 12.
 The Progress of Electric Winding in England.* Gerald Hooghwinkel, M. I. E. E. (73) May 12.
 Public Electric Power Supply to Collieries.* W. B. Woodhouse, M. I. Min. E. (73) May 12.
 The Gas-tight and Flame-proof Motor Problem (Mining).* Talbot Duckitt. (73) May 12.
 Electricity in Cornish Mines.* Neil Taylor. (73) May 12.
 The Position of Electricity in Mining in South Africa.* C. F. Mackness. (73) May 12.
 Centralisation of Power in Collieries.* W. E. Chappell. (73) May 12.
 Notes on Switchgear for Use Underground in Mines.* H. W. Clothier, A. M. Inst. C. E. (73) May 12.
 New Electrical Plant at the Collieries of the Balgonie Colliery Company, Fifeshire.* (22) May 12.
 Exhaust-Steam Plant at the Stafford Coal and Iron Company's Works.* (22) May 12.
 Block Signal System for Mines.* Mosco Haley. (16) May 13.
 Modern Spad Work in Coal Mines.* Douglas Jones. (16) May 13.
 Mine Dust Prevention on the Rand.* E. M. Weston. (16) May 13.
 A Traction Rock Drill for 5-in. Holes 50-Ft. Deep.* George H. Gilman. (Abstract from *Mine and Quarry*.) (13) May 18.
 Use of Quartz in Tube Mills.* A. G. Quartano. (16) May 20.
 A New Filter Frame.* (Abstract from *Monthly Journal*, Western Australia, Chamber of Mines.) (16) May 20.
 Sand Filling. R. W. Schumacher. (Abstract from *The South African Mining Journal*.) (103) May 20.
 Nevada Hills Surface Equipment. J. B. Fleming. (16) May 20.
 A New Auto Traction Rock Drill for Drilling Holes without Changing Steel.* (86) May 24.
 Reinforced Concrete Heapstead at Bentley Colliery.* (22) May 26.
 How to Build an Arrastre.* W. H. Storms. (16) May 27.
 Concrete in Mining.* George S. Rice. (Paper read before the Nat. Assoc. of Cement Users.) (103) May 27.
 Buffalo-Susquehanna Sagamore Mine.* R. Dawson Norris Hall. (45) June.
 The Coal Mines of Dawson, N. Mex.* Jo. E. Sheridan. (45) June.
 Pumping and Siphoning Hot Water.* (Mines.) J. T. Beard. (45) June.
 Comparative Grinding Experiments with a Chilean Mill and a High Speed Roll at the Detroit Copper Company's Concentrator, Morenci, Ariz.* Rudolf Gahl. (105) June.
 The Butters Filter Plant at the Crown Mines, Ltd.* (105) June.
 The Care of Mine Mules. (45) June.
 Coal Mining in Spitzbergen.* F. A. Talbot. (16) June 3.
 Electricity at Alabama Coal Mines.* A. F. Elliott. (16) Serial beginning June 3.
 Some Principles and Methods for Controlling Underground Excavations.* Robert B. Brinsmade. (Abstract from *Mining World*.) (86) June 7.
 Magnetic Surveys of Iron Deposits.* Ralph S. Archibald. (16) June 10.
 Calumet & Hecla Milling Process.* Howard G. Wright. (16) June 10.
 Hematite Deposits of the Ozark Uplift.* Norman L. Ohnsorg. (103) June 10.
 Filling Methods at Sudbury.* W. R. Crane. (16) June 17.
 Down-Draft Sintering Experiments. Earl S. Bardwell. (16) June 17.
 Tonopah Mining Company's Mill.* Claude T. Rice. (16) June 17.
 Ventilation at the Leyden Mine.* (16) June 17.
 Candelaria Company's Pumping Plant. George A. Laird. (16) June 24.
 Mining on the Gogebic Range.* Percival S. Williams. (45) July.
 Unwatering El Cobre Mines by Air Lift. E. H. Emerson. (6) July.
 The Testing of Miners' Oil.* C. E. Scott. (45) July.
 Electricity in Mining.* Walter C. Wagner. (45) July.
 The Cresson Mine.* R. L. Herrick. (45) July.
 Nature and Characteristic Components of Permissible Explosives. Clarence Hall. (Paper read before the West Virginia Coal Min. Inst.) (14) July 1.
 Shaft-Sinking for American Coal Mines: Viewpoint of the Contracting Engineer.* R. G. Johnson. (62) July 3.
 Dredging for Gold in California.* Lewis H. Eddy. (16) July 8.
 Costs of Shaft Sinking and Mine Excavation at Park City, Utah. (86) July 12.
 Air-Compressor at the Altofts Collieries.* (57) July 14.
 High-tension Mining Switchgear.* F. B. Clark. (Paper read before the South Staffordshire and Warwickshire Inst. of Min. Engrs.) (57) July 14.

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Mining—(Continued).

- The Value of Coarse Concentration.* Henry M. Adkinson. (16) July 22.
 The Quincy Amygdaloid Mills.* H. G. Wright. (16) July 22.
 Mine Explosions from Gas Wells.* C. H. Tarleton. (Paper read before the West Virginia Coal Min. Inst.) (16) July 22.
 Gold Dredging in Columbia.* Charles Janin. (103) July 22.
 The History of the Kimberly Mines.* E. M. Weston. (16) July 29.
 Wasp No. 2 Mine, South Dakota.* (16) July 29.
 Designing and Sinking of Shafts.* R. G. Johnson. (16) July 29.
 Etude Comparative des Poussières Combustibles au Point de Vue de l'Inflammabilité.* Taffanel et Durr. (93) May.
 Neuere Eisenbeton-Konstruktionen im Gebiete des Bergbaues.* Mautner. (Paper read before the Deutsche Betonverein.) (51) Serial beginning Apr. 29; (78) May 5.
 Schachtausbau mittels Eisenbetons.* W. Starck. (78) June 12.
 Die Torfgewinnungsmaschine Bauart Strenge.* Paulmann und Blaum. (48) June 17.
 Die elektrischen Anlagen auf den Zechen des Eschweiler-Bergwerkvereins. E. Hellmann. (48) Serial beginning July 8.

Miscellaneous.

- The Valuation of Public Service Corporation Property. Henry Earle Riggs, M. Am. Soc. C. E. (54) Vol. 72.
 Liquid Resistance. R. de Villamil. (12) Apr. 28.
 Upon the Construction of the Wheatstone Bridge for Electrical Resistance Thermometer.* C. F. Marvin. (3) May.
 Application of the Slide-Rule Principle to Reinforced Concrete Design.* Melvin D. Casler. (86) May 3.
 A Court Decision as to the Enforcement of the Time Penalty in Engineering Contracts. (13) May 18.
 Discrimination in Central-Station Rates. Frank F. Fowle. (9) June.
 Going Value of Public Service Corporations as Determined by the Wisconsin Railroad Commission in the Madison Gas and Electric Case. (86) June 14.
 Tables for Use in Determining Earth Pressure on Retaining Walls.* W. E. Weston. (13) June 22.
 Civil Service Examination for Civil Engineer in the Philippine Service. (13) June 22.
 The Cost of Excavation on Large Engineering Works. (12) Serial beginning June 23.
 The Appraisal of the Madison Gas and Electric Co. (86) July 28.
 Notice Nécrologique sur Octave Chanute. (32) Feb.
 La Serbie et la Bulgarie Industrielles Aperçu de leur Développement.* A. Blazy. (22) Feb.
 L'Evaporation & Grimpage et ses Applications.* P. Kestner. (32) Apr.

Municipal.

- The Development of Road Locomotion in Recent Years.* L. A. Legros. (75) Nov., 1910.
 The Road Board's General Directions and Specifications Relating to the Tar Treatment of Roads. (104) Apr. 28.
 The Plants and Methods of Operation of the Asphalt Paving Companies Operating in New York City. Daniel B. Goodsell. (Paper read before the Brooklyn Engrs. Club.) (86) May 3.
 Methods and Cost of Grading, Concrete Curb and Sidewalk Work, and of Macadam and Brick Paving at Gary, Ind., 1908-10.* (86) May 10.
 The Surveyor Road Conference; Road Board's Specifications: The Use of Limestone. (104) May 12.
 Appliances Used by the Berlin Royal Police Fire Brigade.* (11) May 12.
 Cracks in Brick Pavements. Earle R. Whitmore. (Abstract of paper read before the Mich. Eng. Soc.) (14) May 13; (67) July.
 The Use of Mechanical Tests to Determine the Relative Value of Various Stone for Road Construction and Maintenance.* Hector F. Gullan. (Paper read before the Second Irish Road Congress.) (86) May 17; (104) June 9.
 Data on Street-Cleaning Efficiency in Berlin. Rudolph Hering, M. Am. Soc. C. E. (13) May 18.
 Municipal Undertakings at Harwich. Thomas Green. (Paper read before the Inst. of Mun. Engrs.) (104) May 19.
 Work of the Los Angeles County Highway Commission. (14) May 20.
 Details of Construction and Cost Data on Quarrying for the System of Oil Macadam Roads of Los Angeles County, California.* (86) May 24.
 Standardizing Street Widths. John Nolen. (Paper read before the National Conference on City Planning.) (13) May 25; (86) May 31; (96) June 22.
 The Newhall Tunnel, Los Angeles County, California.* (13) May 25; (14) May 20.

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Municipal—(Continued).

- Notes on Kentish Rag Tar-Macadam. P. Walton Harrison. (Paper read before the Inst. of Mun. Engrs.) (104) May 26.
- The Road Problem in the Light of our Present Information. Clifford Richardson. M. Am. Soc. C. E. (Paper read before the National Good Roads Congress.) (14) May 27.
- Effect of Motor Traffic on Oil Macadam.* (86) May 31.
- Deterioration of Macadam Roads and the Probable Cure. Samuel D. Foster. (58) June.
- Inauguration of Street Pavement Tests. James E. Howard. (Paper read before the Nat. Brick Manufacturers' Assoc.) (76) June 1.
- Woolwich and Some of the Works Completed Since 1905. J. Rush Dixon, M. Inst. C. E. (Paper read before the Inst. of Mun. and County Engrs.) (104) June 2.
- Woolwich Footway Tunnel. E. H. Tabor, M. Inst. C. E. (Paper read before the Inst. of Mun. and County Engrs.) (104) June 2; (14) June 17.
- General Directions and Specifications of the Road Board of Great Britain for the Treatment of Roads with Tar. (86) June 7.
- Dust and Its Prevention on City Streets. Arthur H. Blanchard, M. Am. Soc. C. E. (96) June 8.
- The Scale Paraffine Test as Applied to Bituminous Road Compounds. A. W. Dow, M. Am. Inst. Chem. E., and Francis P. Smith, M. Am. Soc. C. E. (13) June 8.
- Concrete Street Paving in Mason City, Iowa. F. P. Wilson. (Paper read before the Iowa Eng. Soc.) (13) June 8.
- Some Costs on Oiled Earth Road Construction in Kansas.* (86) June 14.
- The Road Board Specifications. R. O. Wynne-Roberts, M. Inst. C. E. (104) Serial beginning June 16.
- Road Grading with an Elevating Grader Handled by a Gas Traction Engine.* (86) June 28.
- Organization of the Public Works Departments of the City of Chicago.* J. C. Schniedwind. (86) June 28.
- An Economical Method of Handling Brick for Paving.* Squire E. Fitch. (86) June 28.
- Methods and Costs of Asphalt Macadam Construction at Santa Ana, Cal.* W. A. Gillette. (86) June 28.
- A Review of the Progress of City Planning.* B. Antrim Haldeman. (2) July.
- The Illumination of Streets and Open Places. E. Darrow. (60) July.
- The Extravagance of Paving Methods in New York. Nelson P. Lewis. (14) July 1.
- Trinidad Asphaltic Petroleum and its Use as Road Material. Albert Sommer. (14) July 1.
- Standard Plans and Specifications for Grading, Seattle, Wash.* (86) July 5.
- Notes on Permanent Way and Highways at Croydon. E. F. Morgan. (Paper read before the Inst. of Mun. and County Engrs.) (96) July 6; (104) June 2.
- Standard Plans and Specifications for Sidewalks, Seattle, Wash.* (86) July 12.
- Relation Between Modern Traffic and the Alignment and Profile in Highway Design. Henry B. Drowne. (Paper read before the Assoc. for the Advancement of Sci.) (96) July 13.
- Town Planning in Congested Areas and Improvements and Street Widening in the City of Leeds. W. T. Lancashire, M. Inst. C. E. (Paper read before the Inst. of Mun. and County Engrs.) (104) July 14.
- A Machine for Preparing Asphalt Paving Compositions.* (13) July 13.
- Cost Data on Bituminous and Waterbound Macadam Roads. W. G. Harger. (13) July 13.
- Standard Plans and Specifications for Retaining Walls, Seattle, Wash.* (86) July 19.
- Éléments de Constructions Urbaine.* J.-N. Cloquet et M. De Vaere. (31) 1911, Pt. 1.
- Ille Congrès International de la Route tenu à Bruxelles en 1910; Rapport des Délégués Français sur les Travaux du Congrès. (43) Mar.
- Railroads.**
- Experiments on Retaining Walls and Pressures on Tunnels.* William Cain, M. Am. Soc. C. E. (54) Vol. 72.
- Traction Stresses.* S. Blumenthal. (5) Oct., 1910.
- The Standardization of Locomotives in India, 1910.* Cyril Hitchcock. (75) Oct., 1910.
- Method of Estimating the Probable Volume of Railway Traffic.* George Rathjens. (Paper read before the Civ. Engrs. Soc. of St. Paul.) (1) Mar.
- The Beacon Hill Tunnel, Kowloon-Canton Railway.* (12) Apr. 28.
- Railway Signal Standards No. 17, The Southern and Union Pacific.* (87) May.
- Desplaines Valley Railway.* (87) May.

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Railroads—(Continued).

- Mt. Union Tie-Treating Plant, Pennsylvania R. R. (87) May.
 The Permanent Way of the Great Indian Peninsula Railway.* (21) May.
 Refrigerator Cars.* (21) Serial beginning May.
 Pressing Wheels on Axles and Apparatus for Recording the Pressures Used.* (21) May.
 2-8-0 Tank Engines, Great Western Railway.* (21) May.
 The Electrification of the Steam Railroads in the Boston Metropolitan District.* (Discussion before the Boston Soc. Civ. Engrs.) (1) May.
 Crawford Underfeed Locomotive Stoker.* (25) May.
 Locomotive Terminal at East Clinton, Ill. Chicago & Northwestern Railway.* (25) May.
 Maximum Power Locomotive 2-10-10-2 Type.* M. H. Halg. (25) May.
 Dynamometer Car of 110 000 Lbs. Capacity—Chicago, Milwaukee & St. Paul Railway.* (25) May.
 New Baltic Type, Compound, Superheated Steam Locomotives.* Charles R. King. (From *Machinery*.) (88) May.
 Three Years' Experience of the Use of Superheated-Steam Locomotives.* J. T. Bierman. (From *Die Ingenieur*.) (88) May.
 Concrete For Railway Work. J. P. H. Perry. (65) May.
 Mallet Locomotive with Superheater, 0-8-8-0 Type—Baltimore & Ohio Railroad.* (25) May; (18) July 15.
 The Schenck Locomotive Scale.* (25) May.
 Tests of Freight Car Trucks.* (25) May.
 Combination Electric Turntable Tractor and Engine Haul.* (25) May.
 Improvements in the Transport and Distribution of Goods in London. A. W. Gattie. (29) May 5.
 Locomotive Characteristics.* Lawford H. Fry. (11) May 5.
 Extension of Terminal Facilities, E. J. & E. Ry.* (18) May 6.
 Progress Records in Driving the Loetschberg Tunnel and a General Description of the Methods of Work.* (86) May 10.
 A Storage-Battery Truck for Handling Package Freight in Railway Freight-houses.* (13) May 11.
 The Mechanical Handling of Package Freight.* M. B. Waterman. (13) May 11.
 Single-Phase Current in Electric Railway Service.* F. H. Dimock. (27) May 11.
 Electrification of the London, Brighton & South Coast Railway.* (73) May 12; (12) May 12; (13) June 8; (21) June.
 The Kwangtung Section of the Canton Hankow Railway.* (12) Serial beginning May 12.
 Goods Locomotive With Trailing Truck: Natal Government Railways.* (11) May 12.
 Grade Revision and Terminal Work on the Chicago Great Western.* (15) May 12.
 Grand Central Interlocking Machine.* (15) May 12.
 Proposed Rules for the Inspection of Locomotive Boilers.* (18) May 13.
 Selection of Alternating Current Signalling Apparatus. L. Frederick Howard. (Abstract of paper read before the Ry. Signal Assoc.) (18) May 13; (87) June.
 Mikado Type Locomotive for the Chicago, Burlington & Quincy R. R.* (18) May 13.
 Improvements on the Southern Railway.* F. Lavis, M. Am. Soc. C. E. (14) May 13.
 Methods of Constructing a 95-ft. Fill Across Papio Valley on the Union Pacific Ry.: A Comparison of Costs of Excavation by Old and Modern Outfits.* John W. King. (Abstract of paper read before the Am. Soc. of Eng. Contractors.) (86) May 17.
 The Bury Ballast Trimmer.* (15) May 19.
 Devices for Preventing the Splitting of Ties.* Hermann von Schrenk. (15) May 19.
 Different Methods and Comparative Costs of Ditching Cuts. George H. Bremner. (Paper read before the Burlington Assoc. of Operating Officers.) (15) May 19.
 Baltimore & Ohio Gravity Yard at Chicago Junction, Ohio.* (15) May 19.
 Comparative Tests of Mallet Locomotives; Norfolk & Western.* (15) May 19.
 Express Locomotive, with Schmidt's Steam-Superheater, for the Dutch State Railways of Java.* (11) May 19.
 Scrap Yard of the A. T. & S. F. Ry. at Corwith, Ill.* (18) May 20.
 Dispatcher-Controlled Train-Order Signals for Interurban Electric Railways.* (17) May 20.
 The 1 200-Volt Equipment of the Shore Line Electric Railway.* (17) May 20.
 Block Signals with Automatic Stops on the Interurban Electric Lines of the Washington Water Power Co.* (13) May 25.
 Heavy Double-Ended Locomotive for Mexico.* (12) May 26.
 The Street Locomotive Stoker.* (15) May 26.
 Slow-Speed Direct-Current Locomotives For Colliery Service.* (17) May 27.

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- Power Driving of Screw Spikes on the C. R. I. & P. Ry.* (18) May 27.
 "Pacific" Type Express Engine; State Railways of Italy.* (21) June.
 Notes on Paris, Lyons and Mediterranean R. Locomotives.* (21) June.
 4-6-2 Tank Engines; Great Central Railway.* (21) June.
 The Permanent Way of the Roumanian State Railways.* (21) June.
 Signalling at London Road Station, Manchester; Great Central Railway.* (21) June.
 The Harrington Cab Signal and Automatic Stop.* (21) June.
 Report on the Question of Electric Traction; Subject for Discussion at the Railway Congress. W. Wyssling. (88) June.
 Building, Bridge and Track Standards of the Illinois Traction System.* (13) June 1.
 A New Design of Railway Coaling Station.* (13) June 1.
 China's Most Modern Railway.* Lewis R. Freeman. (15) June 2.
 Setting Outside Admission Valves with Walschaert Gear.* (From Record No. 70. Baldwin Locomotive Works.) (15) June 2.
 Repair Shops and Locomotive Terminal; Kansas City, Mexico & Orient.* (15) June 2; (18) June 24; (87) July.
 Lubricating Locomotive Valves and Cylinders with Graphite.* (15) June 2.
 Boring, Turning and Mounting Car Wheels and Axles.* W. H. Markland. (15) June 2.
 Some French Locomotive Performances.* J. T. Burton-Alexander. (12) Serial beginning June 2.
 The Great Zig-zag on the Great Western Railway, New South Wales.* (11) June 2.
 Central Power Plants and Electricity Supply for Trunk Line Railroads. Fred Darlington. (Abstract of paper read before the National Elec. Light Assoc.) (17) June 3.
 Parma Single-Phase Railway.* (17) June 3.
 Running Triple Valves Without Lubrication. Lincoln Leonard. (Abstract of paper read before the Air Brake Assoc.) (18) June 3.
 Friction of New and Worn Brake Shoes on New and Worn Cast Wheels.* A. S. Williamson. (Abstract of paper read before the Air Brake Assoc.) (18) June 3.
 Maintenance of Equipment Costs.* C. J. Morrison. (15) June 9.
 Controlling Modern Passenger Trains.* Walter V. Turner. (Abstract of paper read before the Air Brake Assoc.) (15) June 9; (96) June 22; (13) July 6; (18) July 15.
 Car Equipment Inspection and Maintenance on the Long Island Railroad.* (17) June 10.
 New 82-Ton Electric Locomotive of the Northern Electric Railway.* J. Paulding Edwards. (17) June 10.
 New Roundhouse of the Intercolonial Ry. of Canada at Campbellton, N. B.* (18) June 10.
 The New Chicago & Northwestern Ry. Passenger Terminal in Chicago.* (18) June 10; (15) June 9; (87) June.
 Improvements on the Montclair Branch, Lackawanna Railroad.* (14) June 10.
 Methods of Computing the Dimensions of Railway Crossings.* (86) June 14.
 Cost of Railroad Signal Protection. James B. Latimer. (86) June 14.
 The Importance of Scientific Investigation in Railroad Contracting.* John W. King. (Paper read before the Am. Soc. of Eng. Contractors.) (96) June 15.
 Some Further Notes on Train Resistance. C. F. Dendy Marshall. (12) June 16.
 Rainy Lake Revision of Line of the Canadian Northern.* (15) June 16.
 Enlargement of the Covington Tunnel.* (15) June 16.
 Mikado and Pacific Type Locomotives; Baltimore & Ohio.* (15) June 16; (18) June 10.
 Kinds of Wood Best Adapted for Cross Ties. F. J. Angier. (Paper read before the Burlington Assoc. of Operating Officers.) (15) June 16; (96) July 27.
 Forty-Foot Refrigerator Car.* (15) June 16.
 Waldron's Automatic Stop.* J. M. Waldron. (Paper read before the Ry. Signal Assoc.) (15) June 16.
 Mallet Articulated Locomotives for the Duluth, Missabe & Northern Ry.* (18) June 17.
 Apparatus for Charging Storage Batteries (Signals).* H. K. Ferguson, R. E. Russell and E. E. Kimball. (Paper read before the Ry. Signal Assoc.) (18) June 17.
 Express Refrigerator Cars for the Chicago, Milwaukee & Puget Sound Ry.* (18) June 17.
 Locomotive Using the "Straight Flow" System of Steam Distribution.* (18) June 17.
 New Steel Motor Cars of the Long Island Railroad.* (17) June 17.
 Efficiency and Economy in Hot Water Boiler Washing.* (18) June 17.
 Pennsylvania Terminal Service Plant.* A. D. Blake. (64) June 20.
 Electric Trucks for Handling Baggage and Freight. (13) June 22.

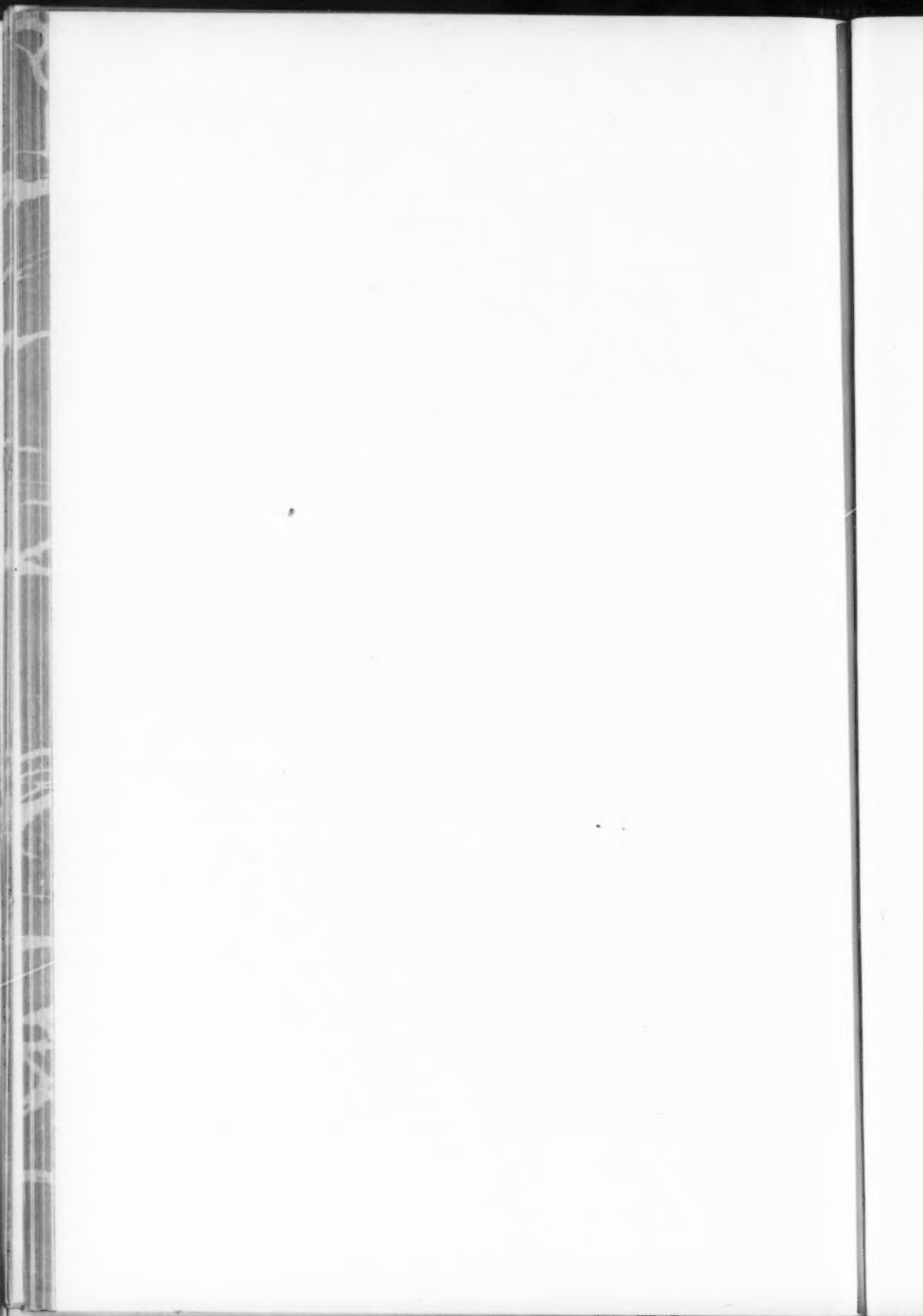
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- Table for Use in Determining Earth Pressure on Retaining Walls.* W. E. Weston. (13) June 22.
- 4-6-0 Type Passenger Compound Locomotive; Portuguese Railway.* (11) June 23.
- The "A B C" Central-Buffer Coupler.* (11) June 23.
- New Rolling Stock, Swedish State Railways.* (12) June 23.
- M. K. & T. Freight House at St. Louis.* (15) June 23.
- 57 $\frac{1}{4}$ -Ton Steel Hopper Coal Car; Norfolk & Western.* (15) June 23.
- Prentice's Wireless Train Control.* (15) June 23.
- Automatic Block Signals on the Illinois Traction System.* John Leisenring. (17) June 24; (14) June 17.
- Operating Practices of the Hudson Companies.* (17) June 24.
- The Paulding and Mace Avenue Subway, New York.* (14) June 24.
- The Madeira-Mamoré Railway.* P. H. Ashmead. (15) June 30.
- New Signaling at Washington; P. B. & W.* (15) June 30.
- Heat Balances in Locomotive Boilers. Lawford H. Fry. (11) June 30.
- Balanced Compound Locomotives and Their Working on the State Railways of Prussia.* Charles R. King, M. I. C. E. (21) July.
- The M. D. M. System of Power Signalling.* (21) July.
- Electrification of Suburban Railways.* F. W. Carter. (75) July.
- The Cost of Electrically-Propelled Suburban Trains. H. M. Hobart. (75) July.
- The Electrification of Railways: An Imperative Need for the Selection of a System for Universal Use.* George Westinghouse. (75) July.
- Economics of Tonnage Rating.* J. G. Van Zandt. (87) July.
- Signaling on the Atlantic Coast Line.* (87) July.
- Economics of Railway Electrification.* Wm. Bancroft Potter. (75) July.
- Electrification of Trunk Lines. L. R. Pomeroy. (75) July.
- English Running-Shed Practice.* Cecil W. Paget. (75) July.
- Handling Locomotives at Terminals. Frederic M. Whyte. (75) July.
- Engine-House Practice, or the Handling of Locomotives at Terminals to Secure Continuous Operation.* F. H. Clark. (75) July.
- American Locomotive Terminals.* William Forsyth. (75) July.
- Handling Engines.* H. H. Vaughan. (75) July.
- Locomotive Shops at Cape Charles, Va.* (25) July.
- Pacific Type Locomotive Arranged for Burning Lignite.* (25) July.
- A Tabular Comparison of Notable Examples of Recent Locomotives Arranged with Respect to Classes and Weights. (25) July.
- Locomotive Performance under Different Degrees of Superheated Steam. C. H. Benjamin and Louis E. Endsley. (Paper read before the Amer. Ry. Master Mechanics' Assoc.) (25) July; (18) July 1.
- Repair Equipment for Engine Houses. (Report to Amer. Ry. Master Mechanics' Assoc.) (25) July.
- Contour of Tires.* (Report, Amer. Ry. Master Mechanics' Assoc.) (25) July.
- Revision of Code of Tests.* (Report, Amer. Ry. Master Mechanics' Assoc.) (25) July.
- Train Brake and Signal Equipment.* (Report, Amer. Ry. Master Mechanics' Assoc.) (25) July.
- Mallet Superheater Locomotives for the Delaware & Hudson Co.* (18) July 1.
- Passenger Station Shelters at Steubenville, Ohio.* (14) July 1.
- Electrification of the Hoosac Tunnel.* (17) July 1; (64) July 4; (13) June 8.
- Handling Freight by Telpherage in a St. Louis Railway Terminal.* (14) July 1.
- Structural Features of the Missouri, Kansas & Texas Terminal Freight House.* (14) July 1.
- Crescoting Plant of the Pennsylvania R. R. at Philadelphia, Pa.* Grant B. Shipley. (13) July 6.
- Setting Inside Admission Piston Valves with Walschaert Gear.* (15) July 7.
- New Shops of the New York, Philadelphia & Norfolk.* (15) July 7.
- Passenger Locomotive for the Central Argentine Railway.* (11) July 7.
- Superheating on the Chicago and North-Western Railroad.* (12) July 7.
- Flange Lubrication.* (Abstract of report to Amer. Ry. Master Mech. Assoc.) (18) July 8; (25) Aug.
- Mallet Articulated Freight Locomotives for the Southern Pacific Co.* (18) July 8.
- Latest Type of Interurban Car for McKinley System.* (17) July 8.
- Construction of Bloomfield Grade-Crossing Improvements.* (14) July 8.
- Values of Curvature, Distance, Rise and Fall. F. Lavis, M. Am. Soc. C. E. (14) July 8.
- Tests of Resistance of Freight Car Trucks when out of Square. (13) July 13.
- A Suspended Railway to the Aiguille du Midi.* Alfred Gradenwitz. (26) July 14.
- The Hanna Locomotive Stoker.* (15) July 14.
- Venice Power Station of Illinois Traction System.* (17) July 15.
- Gas-Electric Motor Cars. W. B. Potter. (96) July 20.
- The Effect of Grades on Operating Costs.* C. J. Morrison. (15) July 21.

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Railroads—(Continued).

- Electric Switching Locomotive; New York, New Haven & Hartford.* (15) July 21.
 The Use of Rail Anchors.* (15) July 21.
 Second Track Construction on the Pennsylvania between Indianapolis and Richmond.* (15) July 21.
 Derrick Cars in Maintenance Work.* (15) July 21.
 Combined Carhouse and Shop, Bridgeport, Conn.* (17) July 22.
 A Trackless Trolley System in England. (14) July 22.
 Gasoline-Electric Traction in Europe.* Francis E. Drake. (27) July 22.
 The Grand Trunk Transcontinental Canadian Railway, a New 3590-Mile Road with Light Grades and Easy Curves.* (19) July 22.
 Frog and Switch Shops of the C., M. & St. P. Ry., at Tomah, Wis.* (18) July 22.
 Pacific Type Locomotives for the Minneapolis, St. Paul & Sault Ste. Marie Ry.* (18) July 22; (25) Aug.
 The Testing of Locomotive Fuel.* F. O. Bunnell. (Abstract of paper read before the Inter. Ry. Fuel Assoc.) (18) July 22.
 A Study of the Ventilation of Sleeping Cars. Thomas R. Crowder. (Abstract of paper read before the Amer. Public Health Assoc.) (96) July 27.
 Single-Phase Locomotive Equipment for the Loetschberg Line in Switzerland.* M. P. Misslin. (27) July 29; (17) July 29.
 A Practical Demonstration in Fuel Economy.* (15) July 28.
 The Determination of Rock Temperature in Long and Deeply Overlaid Tunnels.* E. Lauchli. (14) July 29.
 Electric Freight Trucks used by the Erie R. R. at Jersey City, N. J.* (18) July 29.
 The Bay Ridge Improvement of the Long Island Railroad.* (14) July 29.
 Locomotive Terminal at New Durham, N. J.* (25) Aug.
 Tests of Brake Shoes.* (Report of Comm. Master Car Builders' Assoc.) (25) Aug.
 Report of Comm. on Best Construction of Locomotive Frames.* (Master Mechanics' Assoc.) (25) Aug.
 Solutions Nomographiques de Questions Relatives aux Chemins de Fer.* L. Potin. (43) May.
 Calcul des Longerons Armés pour Véhicules de Chemins de Fer.* A. Nachtergal. (34) May.
 Quadruplement de Voies et Construction de Lignes Nouvelles dans la Banlieue Desservie par la Compagnie du Nord.* L. Finat. (38) May.
 L'Electrification des Chemins de Fer. de Valbreuze. (92) May.
 Nouvelle Méthode d'Essai des Rails.* Ch. Fremont. (33) May 6.
 L'Eclairage des Trains, Etude du Remplacement de l'Eclairage au Gaz par l'Eclairage Electrique.* (33) Serial beginning May 13.
 Automotrices des Chemins de Fer du Sud de la France à Courant Monophasé (6000 volts).* (33) May 27.
 Traction Electrique par Courant Alternatif Monophasé Transformé sur la Locomotive en Courant Continu Essais Effectués sur la Ligne de Cannes à Grasse.* Auvert. (38) June.
 Frein à Cric et Barillet de M. Mestre.* E. Sauvage. (92) June.
 De l'Influence des Wagons de Grande Capacité sur les Crises de Transport. A. Henry. (92) June.
 Nouvelles Locomotives Compound Articulées Système Mallet.* L. Pierre-Guédon. (33) June 10.
 La Répétition des Signaux sur les Locomotives, ses Avantages et ses Inconvénients.* (33) Serial beginning June 24.
 Note sur le Chemin de Fer Electrique de la Bernina.* J. Lhériaud. (38) July.
 Note sur le Nouveau Matériel à Voyageurs de la Compagnie des Chemins de Fer Portugais et les Transformations Apportées à l'Ancien Matériel.* Henri Lavialle d'Anglards. (38) July.
 Nouvelle Méthode de Freinage Continu des Longs Trains de Marchandises.* H. Sabouret. (33) July 15.
 Neuerungen im Baue von Weichen.* Schmitt. (102) Apr. 15.
 Einwellen-Wechselstrom-Bahnen, Ausführungen der Siemens-Schuckert-Werke.* (102) Apr. 15.
 Einstellbares Hinter-Drehgestell für lange Lokomotiven.* R. Grimshaw. (102) Apr. 15.
 Die elektrische Bahn Martigny-Orsières.* G. Huldshiner. (107) Serial beginning Apr. 22.
 Die Schnellzuglokomotiven der k. k. österreichischen Staatsbahnen.* Richard Baeker. (53) Apr. 28.
 Kurvenbewegliche Transportlokomotive nach Klien-Lindner.* V. Litz. (48) Apr. 29.
 Neuere Lokomotiven der Lokomotivfabrik J. A. Maffei.* K. Vogl. (102) May 1.
 Entgleisungsursachen und die Deutung der Aufschreibungen des Gleismessers von Dormmüller. H. Dormmüller. (102) May 1.

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- Ein Beitrag zur Lehre von den Gegengewichten der Lokomotive.* J. Jahn. (102) Serial beginning May 1.
- Die Einführung der linksufrigen Zürichseebahn in den Hauptbahnhof Zürich der S. B. B.* (107) Serial beginning May 6.
- Heissdampf-Lokomotiven der Thunerseebahn Serie Ec 4/6.* (107) May 13.
- Elektrische Zugförderung auf preussischen Staatsbahnen. (51) May 17.
- Walzfiguren in einem Schienenprofil.* R. Loebe. (50) May 18.
- Versuchsfahrten mit 2Cl-Vierzylinderverbund-Heissdampflokomotiven der württembergischen Staatseisenbahnen.* Dauner. (48) May 27.
- Brig-Furka-Disentis-Bahn.* (107) June 10.
- Die Anwendung des Eisenbetons im Eisenbahnbau.* K. W. Schaechterle. (51) Serial beginning June 10.
- Die elektrische Zugförderung auf der Strecke Blankenese-Ohlsdorf. H. v. Glinski. (102) June 15.
- Sicherheitsvorschriften für die Einrichtung elektrischer Beleuchtung in Eisenbahnwagen. (102) June 15.
- Zur Ermittlung der Anzahl der Gleisunterhaltungsarbeiter und der Gleisunterhaltungskosten. Lotz. (102) Serial beginning June 15.
- Das deutsche Eisenbahnwesen in der Internationalen Industrie- und Gewerbeausstellung, Turin 1911.* R. Anger. (48) Serial beginning June 17.
- Vom Bau der Weissensteinbahn.* Werner Luder. (107) Serial beginning July 1.
- Vierzylinder-Verbund-Heissdampflokomotive Serie A 3/5 der S. B. B.* (107) July 1.
- Linienführung und Unterbau industrieller Bahnen.* A. Bielschowsky. (80) July 6.
- Elektrische Industriebahnen.* P. Büttner. (80) July 11.

Railroads, Street.

- Rail-less Electric Traction in Bremen.* (From *Physical Review*.) (73) Apr. 28. Apr. 28.
- Electric Railway Block Signaling.* (87) May.
- The New North-South Subway in Paris.* (14) May 13; (12) June 23.
- Lengthening the Station Platforms of the New York Subway.* Walter G. Federlein, Assoc. M. Am. Soc. C. E. (14) May 13.
- The 191st Street Subway Station, New York City.* (14) May 20.
- New Express Cars of the Old Colony Street Railway.* (17) May 20.
- Method of Constructing a Section of Passenger Subway on Cylinder Piers, Paris, France.* (86) May 24.
- System of the Havana Electric Railway Company.* F. W. Hild. (17) Serial beginning May 27.
- Results of 1200-Volt Direct-Current Operation on the Washington, Baltimore & Annapolis Electric Railway.* (17) May 27.
- A Remodeled Street Railway Plant.* Warren O. Rogers. (64) May 30.
- Manganese Steel in Street Railway Special Work.* (86) May 31.
- Testing and Manufacture of Reinforced Concrete Trolley Poles.* (14) June 24.
- Standard Car of the New South Wales Government Tramways.* (17) July 1.
- Steps in the Solution of the Problem of Adequately Controlling Electrically Propelled Vehicles. W. V. Turner. (Abstract of paper read before the St. Ry. Assoc. of the State of New York.) (17) July 1.
- The Edison-Beach Storage Battery Car. R. H. Beach. (Abstract of paper read before the St. Ry. Assoc. of the State of New York.) (96) July 20.
- A Few Reasons why Electric Traction in England Remains Stationary.* Gerald H. J. Hooghwinkel. (Abstract of paper read before the Tramways and Light Rys. Assoc.) (73) July 21.
- Novel Methods in the Brooklyn Fourth Ave. Subway Construction, New York City: Section 11-A-3.* S. P. Brown, M. Am. Soc. C. E. (13) July 27.
- Le Chemin de Fer Métropolitain de Paris, Ligne No. 4, de la Porte de Clignancourt à la Porte d'Orléans.* J. Hervieu. (35) Serial beginning June.
- Les Ascenseurs et Escaliers Mécaniques du Métropolitain de Paris.* P. Calfas. (33) June 17.
- Die künftigen Wiener elektrischen Untergrund-Schnellbahnen. O. Blum. (102) Serial beginning July 1.

Sanitation.

- The Water-Works and Sewerage of Monterrey, N. L., Mexico.* George Robert Graham Conway, M. Am. Soc. C. E. (54) Vol. 72.
- The Relation of Flies to the Transmission of Infectious Diseases.* Herbert D. Pease. (28) Mar.
- The Use of the Salinometer in Studies of Sewage Disposal by Dilution.* Kenneth Allen, M. Am. Soc. C. E. (Paper read before the Boston Soc. of Civ. Engrs.) (1) Apr.
- Pumping Plant for Sewerage and Waterworks.* Alfred J. Price. (Paper read before the Inst. of Mun. and County Engrs.) (104) Serial beginning Apr. 28.

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Sanitation—(Continued).

- Heating Flueless Rooms.* J. H. Brearley. (Paper read before the Gas Mgrs. Assoc.) (66) May 2.
- Some of the Public Works of Croydon.* Geo. F. Carter. (Paper read before the Inst. of Mun. and County Engrs.) (104) May 5.
- Bacterial Purification of Ammonia-Recovery Liquor. Gilbert J. Fowler, E. Ardern and W. T. Lockett. (Abstract of paper read before the Soc. of Chemical Industry.) (66) May 9.
- A 37-Mile Ditch System for Draining 77 000 Acres of Bottom Lands in Carroll County, Missouri, with Estimates of Cost.* (86) May 10.
- Cost of Pipe Sewers and Appurtenances in Water Bearing Sand, Gary, Indiana.* (86) May 10.
- Factory Sanitation and Efficiency. C.-E. A. Winslow. (Paper read before the Mass. Inst. of Tech.) (14) May 13.
- Sedimentation in an Experimental Imhoff Tank.* (14) May 13.
- A Florida Drainage Project. (14) May 13.
- Ventilation Equipment, Hotel Sherman.* (101) May 13.
- Revision of Downtown Chicago's Sewerage System. (86) May 17.
- Sanitary Engineering Conditions in Milwaukee. (14) May 20.
- The Disposal of the Sewage and Protection of the Water Supply of the City of Milwaukee.* (Abstract of Report to the City Council.) (86) May 24.
- Influence of Underdrainage on Spring Floods. W. H. Day. (From Report of Minister of Agriculture, Ontario.) (96) May 25.
- New Sewage Disposal Works and Pumping Station, Stratford-Upon-Avon. H. D. Bell. (Paper read before the Inst. of Mun. and County Engrs.) (104) May 26.
- Heat Calculations in Factory Heating. H. C. Russell. (101) Serial beginning May 27.
- Heating, Ventilating and Air-Washing Plant in the John B. Stetson Company's Building, Philadelphia.* (70) June.
- The Experimental Imhoff Sewage-Clarification Tank at Philadelphia and the Original Tanks in the Emscher District of Germany, with Introduction by Rudolph Hering, M. Am. Soc. C. E.* Charles Saville. (13) June 1.
- A Smoke Dissipating Chimney.* (Abstract from *Die Umschau*.) (46) June 3.
- Specifications for Open Drainage Ditches, Drain Tile and Tile Drainage Ditching. S. F. Moeller. (86) June 7.
- Street Dust and Street Cleaning in Relation to Health, Comfort, and Economy. J. H. Landis. (Paper read before the State and Local Boards of Health of Ohio.) (96) June 8.
- Hypochlorite Disinfection of Indoor Swimming Tank, at Northwestern University. W. Lee Lewis. (13) June 8.
- Valves for Fractional Radiator Heating.* (101) June 10.
- Methods and Cost of Constructing a Submerged Sewer Outfall into a Stream. J. C. Schneidwind. (86) June 14.
- Furnace Heating of Residence in Russia.* (101) June 17.
- Sewage-Disposal Plant at Santa Clara.* (14) June 17.
- Typhoid Fever Epidemic at Erie.* C. A. Jennings. (14) June 17.
- Water-Supply and Sewerage of the National Rifle Range, Camp Perry, Ohio.* R. Winthrop Pratt, M. Am. Soc. C. E. (13) June 22.
- Constructing a Concrete Storm Sewer at Montgomery.* G. C. Bayles. (14) June 24.
- The Treatment of the Govan Sewage.* W. C. Easton. (Paper read before the Inst. of Mun. and County Engrs.) (96) June 29; (104) June 2; (14) June 3; (104) Serial beginning June 9.
- The Discharge of Unpurified Sewage into the Hudson River near Yonkers.* W. M. Black. (100) July.
- Vitrified Pipe vs. Concrete.* E. Argo. (Abstract of paper read before the Ill. Soc. of Engrs. and Survs.) (76) July 1.
- Sewage Disposal at Pleasanton, California.* (14) July 1.
- Sewage Purification Results at Plainfield during 1910-11. R. S. Lanphear. (14) July 1.
- Coefficients of Heat Transmission. R. Allen. (Abstract of paper read before the National Dist. Heating Assoc.) (64) July 1; (47) July 21.
- Operation and Extension of Sewage Disposal Works, Reading, Pa.* (86) July 5.
- An Economic Study of Garbage Disposal with Special Reference to Conditions in Davenport, Iowa. John W. Alvord. (86) July 5.
- General Specifications for the Construction of Open Drainage Ditches. (86) July 5.
- Protection of River and Harbor Water from Municipal Wastes.* Charles-Edward Amory Winslow. (19) July 8.
- Heating, Ventilating and Power Plant, Boston Opera House.* Charles L. Hubbard. (14) July 15.
- Some Extracts from the Report on the Epidemic of Typhoid Fever in the City of Ottawa, Ont., 1911. (96) July 27.

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Sanitation—(Continued).

- A Curious Case of Erosion in Storm Water Sewers and its Explanation.* W. K. Palmer. (86) July 12.
- Standards of Safety in Relation to Machinery.* David S. Beyer. (20) Serial beginning July 13.
- Intercepting Sewers and Stream Improvements at Syracuse, N. Y.* Stephen B. Vernon, Assoc. M. Am. Soc. C. E. (13) July 13.
- Horse-Power Rating of Heating Apparatus.* Frank L. Busey. (Paper read before the Amer. Soc. Heating and Ventilating Engrs.) (101) July 14.
- Standard Plans and Specifications for Sewers, Seattle, Wash.* (86) July 26.
- A Strong Recommendation for Direct City Construction Instead of Contract Work at New Orleans.* (13) July 27.
- East San Jose Sewage Disposal Plant.* (14) July 29.
- Harbor Water for Flushing New York Streets. (14) July 29.
- The Combustion of Town Refuse.* Francis H. Davies. (64) Aug. 1.
- Production et Distribution d'Énergie Calorifique à Domicile par Station Centrale Urbaine.* A. Beurrienne. (32) Apr.
- De l'Humidité dans les Constructions et Procédés Nouveaux pour y Remédier.* A. Knapen. (32) Apr.
- Le Traitement des Ordures Ménagères par Digestion dans la Vapeur, à Columbus (Ohio, E.-U.).* (33) May 20.
- Grösste und kleinste Kanalgefälle. A. Wulsch. (52) May 15.

Structural.

- The Evolution of the Weldless Steel Chain.* Alex. G. Strathern, M. I. Mech. E. (Abstract of paper read before the South Wales Inst. of Engrs.) (47) Apr. 28.
- Electrolytic Corrosion in Reinforced Concrete. C. Edward Magnusson and G. H. Smith. (42) May.
- Subaqueous Concrete Work at Goderich.* (67) May.
- Tufa Concrete.* (67) May.
- Electrolytic Corrosion of Iron in Concrete.* Charles F. Burgess. (4) May; (96) June 15.
- Pneumatic Caisson Piers with Extended Footings.* (14) May 6.
- By What Right (Gasholders).* Frank Richards. (14) May 6.
- The Rusting of Iron. A. H. Sabin, M. Am. Chem. Soc. (Abstract of paper read before the Brooklyn Engrs. Club.) (13) May 11.
- The Manufacture and Properties of Hydrated Lime.* Richard K. Meade. (13) May 11.
- Concrete Tanks and How to Make Them.* (96) May 11.
- The Reinforcement of Concrete. (12) May 12.
- The General Electric No. 74 Machine Shop at Lynn.* (14) May 13.
- A Large Reinforced Concrete Factory Building.* (14) May 13.
- Depreciation of Quick Lime. Wm. R. Copeland and Walter Sperry. (14) May 13.
- The Design of a Timber Treating Plant for Railroad Use.* Chas. C. Anthony. (86) May 17.
- A Test for Galvanized Iron to Replace the Copper-Sulphate Method.* W. A. Patrick and W. H. Walker. (13) May 18.
- Revision of the Toronto Building By-Law. (96) Serial beginning May 18.
- The Twelvrees Calculator for Reinforced Concrete.* (104) May 19.
- The Electrical Equipment of a Modern Theatre.* D. C. M. Hume. (73) Serial beginning May 19.
- Theories of Multiple-Way Reinforcement.* E. S. Martin. (14) May 20.
- Pneumatic Caisson Foundations, Emigrant Bank Building, New York.* (14) May 20.
- Some Experimental Data on the Flexure of Flat Circular Plates Within the Elastic Limit.* P. T. Steinthal. (11) May 26.
- Reinforcing the Foundations of the Hanan Building.* (14) May 27.
- The Woolworth Building, New York. (14) May 27.
- Structural Details in Hotel Rector, New York.* (14) May 27.
- The Feasibility of Grouping Timbers for Treatment. W. F. Goltra. (Abstract of paper read before the Wood Preservers' Assoc.) (86) May 31.
- A Summary of Practice in Reinforced Concrete Building Construction.* W. H. Morris. (From *Cornell Civil Engineer.*) (86) May 31.
- A Comparison of Representative Building Laws Concerning Loads and Stresses. John L. Hall. (Paper read before the Pacific Northwest Soc. of Engrs.) (86) May 31.
- Cost of Concrete Foundation for a 24 x 36 In. Nordberg Engine Direct Connected to 300 K. W. Westinghouse Generator. (86) May 31.
- The Materials of Paint Manufacture. G. B. Heckel. (3) June.
- Cement Stock Houses.* Josiah Gibson. (4) June.
- Layout and Operation of a Cement Drain Tile Plant.* C. M. Powell. (67) June.

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Structural—(Continued).

- The Zagelmeyer System of Casting Hollow Cement Building Blocks.* (67) June.
- Reinforced-Concrete Work in Cold Weather.* George C. Newton. (13) June 1.
- Cement Tile Experiments at the O. A. C., 1908-9. W. H. Day. (96) June 1.
- The Comet Telescopic Mast and Hoist.* (73) June 2.
- Serious Injury to a Reinforced-Concrete Building by Electrolysis.* Harold P. Brown, M. Am. Electro-Chem. Soc. (13) June 8.
- Further Experiments on the Electrolytic Disintegration of Reinforced Concrete. (13) June 8.
- The Design of Wind Bracing in Steel Structures.* J. S. Wilson. (11) June 9.
- Painting the Exterior of Wooden Buildings. (14) June 10.
- The "Ransome Unit System"; a Separately-Molded Reinforced-Concrete Construction.* Alexis Saurbrey. (13) June 15.
- The "Unit System" of Separately-Molded Reinforced-Concrete Members as Applied to a Large Factory Building.* (13) June 15.
- State Fair Live-Stock Building at Dallas, Tex., a Novel Arch Roof and Comparison with a Truss Roof.* Howard E. Arthur, M. Am. Soc. C. E. (13) June 15.
- A Japanese Test of a Floor.* (14) June 17.
- Standard Specification for Retort and Fire-Brick Material. (Report to Inst. of Gas Engrs.) (66) June 20.
- Standard Building Regulations for Reinforced Concrete. (Report of Comm. Canadian Cement and Concrete Assoc.) (96) June 22.
- Testing Trap-Rock Screenings for the Percentage of Foreign Material. W. S. Lozier. (13) June 22.
- Novel Caisson Work in Montreal.* (96) June 29.
- Explosion of a Copper Steam Pipe, a Study on the Decay of Copper Brazing.* (47) June 30.
- Testing of Concrete, Reinforced Concrete, and Materials Employed Therein.* (Report to Concrete Inst.) (104) June 30.
- An Eighty-Foot Concrete Girder.* (67) July.
- Fire Prevention and Fire Protection for Manufacturing Plants. F. M. Griswold. (6) July.
- Timber for Ponton Material.* Joseph H. Earle. (100) July.
- A Field Pile Driver.* Richard Park. (100) July.
- Underwriters' Tests of Wall Stacks (Connected with Furnace System).* (101) July 1.
- The Elastic Properties of American Ingot Iron.* E. L. Hancock. (13) July 1.
- The Handling of Cement Mortar by Compressed Air.* (14) July 1.
- The New Campanile in Venice.* Charles A. Brassler. (19) July 1.
- A Cross-Beam Concrete Floor System. Arthur Peabody. (Abstract from *The Wisconsin Engineer*.) (13) July 6.
- The Windsor Machine Company's New Shops.* (20) July 6.
- The General Electric No. 41 Building at Lynn.* (14) July 8.
- Further Investigations on the Constitution of Portland Cement. Clifford Richardson, M. Am. Soc. C. E. (14) July 8.
- A Moderate Size, Steel Frame Foundry Building.* (14) July 8.
- Large Guyed Derricks for Erecting Structural Steel Work.* (13) July 13.
- Influence of Work and Finishing Temperature on the Physical Properties of Steel.* Thos. H. Johnson. (13) July 13.
- Difficult Revision of Cantilever Girder and Column Construction.* (14) July 15.
- Coal Bunker Pressures.* W. E. Belcher. (14) July 22.
- Concrete Stairways in the Hotel Ritz-Carlton.* (14) July 22.
- Reinforced Concrete Y. M. C. A. Building at Manchester. (14) July 22.
- Blast Furnace Slags in Concrete: Report on a Series of Tests by the Carnegie Steel Company to Determine the Practicability of Furnace Slags for Use in Concrete. (62) July 24.
- The Municipal Building, New York City; an Office Building for the City Government.* (13) July 27.
- The Stadium for the New York Baseball Club.* (14) July 29.
- Underpinning a Building Adjoining Deep Foundation Operations. (14) July 29.
- Plant of the National Lumber and Creosoting Company.* Grant B. Shipley. (14) July 29.
- Calcul des Poutres sous Charges Mobile Verticales Epures de Poutre Mobile. C. Schippers. (31) 1911, Pt. 1.
- Note sur les Dégâts Causés par un Incendie dans un Hangar en Béton Armé.* M. Gassier. (43) Mar.
- Application de la Méthode des Points Alignés au Calcul des Poutres en Béton Armé.* d'Ocagne. (43) Mar.
- L'Antiseptique le "Microsol."* Aug. Moreau. (92) May.
- Complément à l'Etude de la Flexion dans les Pièces en Ciment Armé.* Léon Lebrec. (32) May.
- Théorie des Vibrations Transversales d'une Barre Elastique.* J. Resal. (93) May.

*Illustrated.



Structural—(Continued).

- Le Béton Armé de Bois.* N. de Tédesco. (84) May.
 Constructions en Béton Armé faites de Panneaux Moulés à Plat, Système Aiken.*
 A. Jacobson. (33) May 27.
 L'Etanchement des Maçonneries à l'Aide d'Injections de Ciment.* L. Descans et
 L. Grenier.* (30) June.
 Détermination de la Température de la Prise du Béton Employé en Grandes Masses
 et de l'Effet de l'Eau Salée.* (84) June.
 Calcul des Murs de Soutènement.* Moreau. (35) July.
 Die Theorie des mit seinen Pfeilern fest verbundenen kontinuierlichen Trägers.*
 Johann Kossalka. (81) Pt. 3.
 Der Einfluss des elektrischen Stromes auf Zementbeton.* Bloss. (51) Sup.
 No. 13.
 Beitrag zur Theorie der im Eisenbetonbau gebräuchlichen Form der Rippenkuppel.*
 Karl W. Mautner. (79) Vol. 13.
 Eine Güteprobe für Beton System Dr. von Emperger.* Gerhard Neumann. (79)
 Vol. 14.
 Die Entbehrlichkeit der Berechnung der Haftspannungen.* A. Kleinlogel. (51)
 Serial beginning Apr. 29.
 Der Zusammenbruch des grossen Hamburger Gasbehälters und die Euler'sche
 Knickformel.* August Mecklenbeck. (51) May 3.
 Moderne Ausführungen freitragender Holzdächer.* Fritz l'Allemand. (53)
 May 5.
 Der Umbau des Lazenhofes in Wien.* Richard Hoffman. (78) Serial beginning
 May 5.
 Der Einfluss der Korngrösse des Küssandes auf die Druckfestigkeit des Betons.*
 E. Suenson. (78) Serial beginning May 5.
 Versuche mit Betonsäulen, Besprechung des Vortrages.* M. Rudeloff. (Paper read
 before the Deutsche Betonverein.) (78) Serial beginning May 5.
 Kritische Bemerkungen zum Einsturz des Gasbehälters in Hamburg.* L. Schaller.
 (48) May 6.
 Ueber Spannungen in Kesselblechen.* E. Heyn und O. Bauer. (50) May 11.
 Die einfachste Dimensionierungsmethode für Querschnitte mit exzentrisch angrei-
 fenden Druck- oder Zugkräften.* Rich. Wuczkowski. (78) Serial beginning
 May 24.
 Der Einsturz des Gasbehälters in Hamburg und die Knicksicherheit von Eisenkon-
 struktionen.* F. Schule. (107) June 3.
 Das städtische Elektrizitätswerk in Helsingfors (Finnl.)* J. Castrén. (78)
 June 12.
 Kranfahrbahn aus Eisenbeton für die Hafen- und Lagerhaus-Aktiengesellschaft,
 Aken a. E.* Robert Richter. (78) June 12.
 Eisenbeton-Kontrollbalken.* E. Suenson. (78) July 1.
 Transportbeton. H. Burchartz. (78) July 1.
 Kreuzweise bewehrte Platten.* Th. Scharff. (78) Serial beginning July 1.
 Das neue hamburgische Vorlesungsgebäude in konstruktiver Beziehung.* S. C.
 Drach. (78) July 20.

Topographical.

- Errors in Chain-Surveying.* J. E. E. Craster. (11) July 7.

Water Supply.

- Water Purification Plant, Washington, D. C., Results of Operation.* E. D.
 Hardy, M. Am. Soc. C. E. (54) Vol. 72.
 The Water-Works and Sewerage of Monterrey, N. L., Mexico.* George Robert
 Graham Conway, M. Am. Soc. C. E. (54) Vol. 72.
 A New Water Supply for the City of Vancouver, B. C.* H. M. Burwell. (5)
 Oct., 1910.
 Water Hammer. (Topical Discussion.) (28) Mar.
 The Water Storage Systems of Utah, Present and Prospective. H. S. Kleinschmidt.
 (Paper read before Utah Soc. of Engrs.) (1) Mar.
 Water Consumption and Statistics Relating Thereto. Edward S. Cole. (28)
 Mar.
 The Use of Water Ejector for Transporting Sand.* Morris Knowles. (28)
 Mar.
 Of What Thickness Shall We Make the Walls of Our Large Pipe Lines? Allen
 Hazen. (28) Mar.
 The Mechanical Filtration Plant at Newport, R. I.* Robert E. Milligan. (28)
 Mar.
 Gas Producer Pumping Plants at Manchester, Mass.* Raymond C. Allen, Assoc.
 M. Am. Soc. C. E. (28) Mar.
 Water Resources Investigation in Minnesota. Robert Follansbee. (Paper read
 before the Civ. Engrs. Soc. of St. Paul.) (1) Apr.
 Subaqueous Phenomena at the Mouth of the Mississippi River. George W. Lawes.
 (Paper read before the Louisiana Eng. Soc.) (1) Apr.
 9 000 000-Gallon Water Tank for Calcutta.* (12) Apr. 28.

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Water Supply—(Continued).

- Pumping Plant for Sewerage and Waterworks.* Alfred J. Price. (Paper read before the Inst. of Municipal and County Engrs.) (104) Serial beginning Apr. 28.
- Specifications for "A" Grade Vitrified Clay Conduit. (87) May.
- Methods and Costs of Deep Well Drilling.* (Abstract from Water Supply Paper, U. S. Geol. Survey.) (86) May 3.
- The Highest Head Ever Developed on Large Scale.* (96) May 4.
- Some of the Public Works of Croydon.* Geo. F. Carter. (Paper read before the Inst. of Mun. and County Engrs.) (104) May 5.
- The Badcock Two-Cycle Internal Combustion Pump.* (11) May 5.
- The Cooling of Circulating Water.* Edward F. Miller. (Abstract of paper read before the Mass. Inst. of Tech.) (64) May 9.
- The New Mt. Tabor Reservoirs, Portland, Ore.* E. A. Taylor, M. Am. Soc. C. E. (14) May 6.
- Bleaching Powder as an Agent in the Purification of Water. Nicholas S. Hill, Jr. (14) May 6.
- Water Purification by the Puech-Chabal System.* William F. Johnston. (14) May 6.
- Water Meter Rates. Edward W. Bemis. (14) May 6.
- The Marble Falls Dam on the Colorado River.* (14) May 6.
- Conservation of Artesian Well Water. (14) May 6.
- Notes on Making and Laying Concrete Pipe. J. Alden Griffin. (14) May 6.
- Municipal Pumping and Power Plant.* Warren O. Rogers. (64) May 9.
- An Improved Valve and a High-Pressure Pipe Joint.* (13) May 11.
- Comparative Tests of Large Engine and Turbine-Driven Centrifugal Pumps.* Francis Head, M. Am. Soc. M. E. (13) May 11.
- The Security of Irrigation Bonds. Walter E. Lagerquist. (Abstract from *Moody's Magazine*.) (13) May 11.
- The New Water-Supply Tunnel under New York City. (13) May 11.
- Determining Yield of Wells.* Arthur N. Talbot. (Paper read before the Ill. Water Supply Assoc.) (96) May 11.
- Hydro-Electric Development on the Saluda River, near Greenville, S. C. (96) May 11.
- The Filtration and Purification of Water for Public Supply. William Ransom, Assoc. M. Inst. C. E. (Paper read before the Inst. of Municipal and County Engrs.) (104) Serial beginning May 12.
- The Protection of Water Supplies. H. C. H. Shenton. (Paper read before the Soc. of Engrs.) (104) May 12.
- The High Falls Hydroelectric Plant on the Peshtigo River.* (14) May 13.
- Depreciation of Quick Lime (Used in Softening Water).* Wm. R. Copeland and Walter A. Sperry. (14) May 13.
- Rio Guaso Irrigation Dam with Automatic Shutters.* (14) May 13.
- Notes on Three Irrigation Projects in the Punjab, India.* A. B. Segur. (13) May 18.
- Irrigation in the Land of the Five Waters, the Punjab, India.* W. G. Bligh, M. Inst. C. E. (13) May 18.
- Hydro-Electric Plant on the Vermillion River, Ontario, at Watageslick Falls, Installed 1908 by Allis-Chalmers-Bullock Co. for Mond Nickel Co.* A. Shanks. (96) May 18.
- Ozone Water-Sterilizing Plant at St. Petersburg.* (11) May 19.
- The Construction of Impounding Reservoirs.* Edward Sandeman, M. Inst. C. E. (Paper read before the Assoc. of Water Engrs.) (104) May 19; (96) June 8.
- The Granite Reef Diversion Dam, Arizona.* (14) May 20.
- Willow River Irrigation Project. (14) May 20.
- Gate-Valve Operated by Hand under a 164-Ft. Head.* (13) May 20.
- Apparatus for Applying Chemicals to Water Flowing in Pipes under Pressure.* (13) May 25.
- Hydro-Electric Plants in Norway and Their Application to Electrochemical Industries.* A. Scott-Hansen. (Abstract of paper read before the Faraday Soc.) (73) May 26.
- Loss of Head at Bends in Pipes.* E. S. Bellasis. (12) May 26.
- The Geology of Dam Trenches. Herbert Lapworth, Assoc. M. Inst. C. E. (Abstract of paper read before the Assoc. of Water Engrs.) (104) May 26.
- Construction Plant for the East Canada Creek Dam, New York.* (14) May 27.
- Irrigation Project of the Southern Alberta Land Company.* (14) May 27.
- Main Piping in Pumped Water Supply.* R. G. Davis. (101) May 27.
- Reconstruction of a Power Canal and Flume under Service.* (14) May 27.
- The Disinfection of Water. Roger G. Perkins. (Paper read before the Ohio State Board of Health.) (86) May 31.
- The Hydro-Electric Development of the Colorado River in Texas.* (86) May 31.
- The Existing Los Angeles Water Works.* Burt A. Heinly. (60) June.
- Determination of Water Rates for Madison, Wis. (60) June.
- The Water Works of Danville, Ill.* (60) June.
- Chemical Apparatus for Water Purification Plants. Thomas Fleming, Jr. (98) June.

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Water Supply—(Continued).

- A New Theory for the Design of Reinforced Concrete Reservoirs.* Hiram B. Andrews. (Paper read before the Boston Soc. of Civ. Engrs.) (1) June.
- The Law Governing Diversion of Interstate Waters. Carman F. Randolph. (13) June 1.
- Rondout Pressure Tunnel of the Catskill Aqueduct, New York City.* Alfred Douglas Flinn, M. Am. Soc. C. E. (13) June 1; (14) July 15; (46) June 24.
- Graphic Calculation of the Flow of Water in Pipes.* T. G. Bocking. (12) June 2.
- Sterilisation of Water by Ultra-Violet Rays. Max de Recklinghausen. (Paper read before the Assoc. of Water Engrs.) (104) Serial beginning June 2; (12) June 16; (96) July 13; (14) July 8.
- Coefficients for Flow in Pipes. E. S. Bellasis, M. Inst. C. E. (11) June 2.
- The Matabichouan River Power Development.* Franklin Thomas. (Abstract from *The Transif.*) (103) June 3.
- Reinforced Concrete Water Tunnel at Sioux City.* (14) June 3.
- Operation of Torresdale Filters and Tests of *Schmutzdecke*. Francis D. West. (Abstract of paper read before the Ill. Water Supply Assoc.) (14) June 3.
- The Mechanical Filtration Plant at Cohoes.* (14) June 3.
- The New Water Supply of Tynemouth, England.* H. G. Coventry, M. Inst. C. E. (14) June 3.
- The Rock Island Filter Plant.* (14) June 3.
- Water Supply and Fire Protection in the Klondike Gold Fields. (14) June 3.
- The Financial Possibilities of Hydro-Electric Developments in the Central West.* Paul M. Lincoln. (13) June 8.
- A Survey of a Reservoir made from a Barge.* H. V. Joslin, Jun. Am. Soc. C. E. (13) June 8.
- The Colorado River Power Company.* (27) June 8.
- Repairing a Mountain Pipe Line by Welding. (14) June 10.
- Driving the Strawberry Tunnel.* Edward R. Zallinski. (16) June 10.
- Progress on the Tennessee River Power Development.* (14) June 10.
- The New Hauser Lake Dam.* (14) June 10.
- Test of a High-Duty Pumping Engine.* R. W. Angus. (64) June 13.
- The Comparative Merits of Steel and Cast-Iron Pipe. Allen Hazen, M. Am. Soc. C. E. (Abstract of paper read before the Amer. W. W. Assoc.) (13) June 15; (60) July; (86) July 26; (96) June 15.
- The Determination of a Reasonable Return for Public Fire Hydrant Service.* Leonard Metcalf, Emil Kulchling and William C. Hawley, Members, Am. Soc. C. E. (Abstract of paper read before the Amer. W. W. Assoc.) (13) June 15; (96) June 22.
- New Pumping Station at Walton.* (12) Serial beginning June 16.
- Driving a Wet Aqueduct Tunnel in Hard Rock.* Bertrand H. Walt. (14) June 17.
- The Mechanical Filter Plant at Charleroi.* (14) June 17.
- Structural and Construction Features of the Supply System for the South San Joaquin Irrigation Works, California.* (86) June 21.
- Water Losses in Irrigation Canals and Methods of Prevention.* F. W. Hanna. (Paper read before the Idaho Soc. of Engrs.) (86) June 21.
- Difficult Deep Foundation Work at the Hauserlake Dam, Montana.* George A. McKay. (13) June 22.
- Five Months' Work on Tunnel 10-A, Little Lake Division, of the Los Angeles Aqueduct. Charles H. Richards. (13) June 22.
- Water-Supply and Sewerage of the National Rifle Range, Camp Perry, Ohio.* R. Winthrop Pratt, M. Am. Soc. C. E. (13) June 22.
- Water Power from Cannon Falls.* (27) June 22.
- The Horseshoe Dam on the Bow River, Alberta. A. S. Dawson. (12) June 23.
- The Best Method of Treating Water for Locomotive Use, when the Density of Traffic does not Warrant Water Treating Plants.* (Abstract from report to the Amer. Ry. Master Mechanics' Assoc.) (18) June 24.
- The East Park Dam, Orland Project, United States Reclamation Service.* F. H. Tillinghast, Assoc. M. Am. Soc. C. E. (14) June 24.
- Operating Results, Albany Filter Plant. (14) June 24.
- The Palmer Mills Hydroelectric Plant at Three Rivers, Mass.* (14) June 24.
- Condenser Water Intakes, Kentucky Electric Company.* (14) June 24.
- Experience with Water Power Legislation in Oregon. (14) June 24.
- Rapid Sand Filtration, Grand Forks.* H. G. Lykken. (14) June 24.
- A British Columbia Hydraulic Installation.* (96) June 29.
- The Examination of Drinking Water.* (96) Serial beginning June 29.
- The Great Falls Hydraulic Power Plant.* (10) July.
- The Water Supply of a Great City (New York).* J. F. Springer. (10) July.
- New York City's Additional Water Supply from the Catskill Mountains.* Thos. H. Wiggin. (2) July.
- Fire Protection by Gas Engines.* (60) July.
- An Ozone Plant at Great Falls. (14) July 1.
- Concrete-Covered Reservoir for the Town of Brookline.* G. Stanley Whitehead, M. Boston Soc. C. E. (14) July 1.

*Illustrated.



Water Supply—(Continued).

- Practical Notes on the Design and Construction of Earth Dams for Irrigation Works. A. M. McPherson. (Paper read before the Idaho Soc. of Engrs.) (86) July 5.
- Characteristics of Wood Stave Pipe, Some Examples of its Use and Cost for Water Supply. T. Chalkley Hatton. (Abstract of paper read before the Amer. W. W. Assoc.) (96) July 6; (86) June 14.
- A Gas-Engine Pumping Plant.* (13) July 6.
- The Manufacture of Machine-Banded Stave Pipe. (14) July 8.
- The Schaeffer Dam of the Beaver Land & Irrigation Company.* (14) July 8.
- Water-Meter and Waste-Detection Policies. Edward W. Bemis. (14) July 8.
- Valuation of Manitowoc Waterworks. (14) July 8.
- Pure Iron Water Pipe to Resist Corrosion.* D. W. Murphy, M. Am. Soc. C. E. (14) July 8.
- The Jerome Reservoir, North Side Irrigation Project.* (14) July 8.
- Relative Cost to Small Consumers of Water under Meter and Frontage Rates. (86) July 12.
- Troubles with Hot Water Piping and Hot Water Supplies in Buildings. George C. Whipple, M. Am. Soc. C. E. (Abstract of paper read before the Amer. W. W. Assoc.) (13) July 13.
- Southampton Water Supply, Successful Pipe-Scraping Operations.* E. D. Groves. (104) July 14.
- A New Hydraulic Power Station in London.* (12) July 14.
- The Water Laws of Oregon. John H. Lewis, Assoc. M. Am. Soc. C. E. (14) July 15.
- Completion of Large Steel Reservoir at Alexandria. (14) July 15.
- Tests of Materials for Earth Dams in Colorado. (14) July 15.
- The Queen Lane Filters at Philadelphia.* John S. Ely, Assoc. M. Am. Soc. C. E. (14) July 15.
- The Practical Operation of a Water Purification Plant with Special Reference to the Columbus, Ohio, Plant.* Wm. R. Copeland. (86) July 19.
- Methods and Cost of Constructing a 500 000-Cu. Yd. Earth Fill Dam for the Willow River Land & Irrigation Co. in Malheur County, Oregon.* H. L. Dickerson. (86) July 19.
- Water Rates. George G. Earl, M. Am. Soc. C. E. (Paper read before the Amer. W. W. Assoc.) (13) July 20.
- The Effect of Fuel Consumption in New York City upon Temperature and Rain-fall.* Reginald P. Bolton, M. Am. Soc. C. E. (Abstract from paper read before the Amer. Soc. of Heating and Ventilating Engrs.) (13) July 20; (101) July 8.
- Hydraulic Power Development at Grand Falls, Newfoundland, a 23 500-Horsepower Hydraulic Plant, Supplied by Riveted Steel Penstocks 15 Feet in Diameter, for Operating a Pulp and Paper Mill.* (14) July 22.
- Construction of the Waste Weir at the Ashokan Reservoir.* (14) July 22.
- Hypochlorite of Lime Treatment Plant at Erie.* C. A. Jennings. (14) July 22.
- Hydroelectric Plant at Vernon, Vt.* (64) July 25.
- Method and Cost of Making a Water Waste Survey and the Results Obtained, Memphis, Tenn.* (86) July 26.
- The Influence of Forests on Stream Flow in the Merrimac River Basin, New Hampshire and Massachusetts.* (13) July 27.
- Collapse of a Steel Water Conduit from External Air Pressure while under Test; Bull Run Pipe Line, Portland, Oregon.* J. C. Stevens, Assoc. M. Am. Soc. C. E. (13) July 27.
- The Influence of Underdrainage on Spring Floods. W. H. Day. (Abstract of report to Minister of Agriculture.) (96) July 27.
- A Tall Concrete Stand Pipe. (14) July 29.
- Unique Motor-Driven Water-Supply and Fire-Protection System.* (27) July 29.
- Pueblo-Rocky Ford Irrigation Project.* (14) July 29.
- Expériences sur l'Evaporation faites à Arles Pendant les Années 1876, 1877, 1878, 1879, 1880, 1881 et 1882. A. Salles. (43) Mar.
- Les Etablissements de Robinetterie Moderne.* Léon Masson. (92) Apr.
- Le Fer et le Manganèse dans les Eaux Souterraines, la Déferrisation et la Démanganisation. Henri Schwes. (30) June.
- Die Wasserkraftanlage im Murgtal oberhalb Forbach, bearbeitet von der General-direktion der Badischen Staats-eisenbahnen 1910. Theodor Koehn. (48) May 6.
- Ueber einige ausgeführte und projektierte Wasserkraftanlagen in den Alpen.* Raimund Janesch. (53) Serial beginning May 12.
- Ueber die Verringerung des Ungleichförmigkeitsgrades der Wasserförderung, der maximalen Geschwindigkeit der Saug- und Druckwassersäule und des Beschleunigungswiderstandes bei doppeltwirkenden Zwillingspumpen.* Karl Mayer. (53) May 12.
- Experimentelle Untersuchung der Strömungsvorgänge in einer Schnellläufer-Francis-Turbine.* Schuster. (48) May 13.
- Die Turbinen und Pumpen des Wasserwerkes der Stadt Bochum bei Blankenstein a. d. Ruhr.* V. Gelpke. (48) Serial beginning May 13.

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- Versuche und Erfahrung aus dem Wasserturbinenbau.* W. Zuppinger. (107)
 Serial beginning May 20.
 Die Zentrale Cedegolo.* (97) June 5.
 Einsturz und Wiederaufbau des Wehres in der Neisse bei Zelz.* Br. Schulz. (51)
 Serial beginning June 14.
 Das neue Kieker Wasserwerk im Schwentinetal.* E. Birnbaum. (48) June 24.
 Ueber Korrosionserscheinungen an Gussisenventilen und Schmiedeisernen Röhren
 bei Heissdampfleitungen. F. Westhoff. (50) June 29.

Waterways.

- The Red and Atchafalaya Rivers with Relation to Their Separation from the
 Mississippi River. F. M. Kerr. (Paper read before the Louisiana Eng. Soc.)
 (1) Mar.
 The Possibilities of Improved Navigation on the Susquehanna River.* Farley
 Gannett. (98) Apr.
 Detroit River Improvement.* Charles T. Dixon. (Paper read before the Detroit
 Eng. Soc.) (1) Apr.
 New Fish Dock at Fleetwood.* (12) Apr. 28.
 The Electric Winch Installation at Tyne Dock. (12) May 5.
 The Electrical Equipment of the Boston & Albany's East Boston Deep-Water Ter-
 minal.* (27) May 11.
 The New Dock at Methil.* (57) May 12.
 Steel and Concrete Dock Wall: Renewal of South End of Dock No. 10 in Ash-
 tabula Harbor, O.* Charles Benham, Jr. (13) May 18.
 Blackpool Promenade Widening.* (12) May 28.
 The Construction of the Galveston Causeway.* (14) May 27.
 Docking Facilities of the Port of New York.* (95) June.
 The Port of Rangoon.* (12) June 2.
 The New Ship Canal and Locks of the St. Mary's River.* James Cooke Mills.
 (46) June 3.
 Ice Formation on the St. Lawrence.* H. T. Barnes. (96) June 8.
 The New Deep-Water Dock at Southampton.* (11) June 9.
 The Panama Canal.* (12) June 9.
 A Large Pier with Granite Walls.* (14) June 10.
 Paris a Seaport.* (11) June 16.
 Cost of Earthwork in Lower Egypt (Canals). (12) June 16.
 Effects of Water of Different Densities Above and Below a Lock Gate.* Chester
 Harding. (14) June 24.
 Royal Commission on Coast Erosion. (12) Serial beginning June 30.
 Rock Dredging at Carr Shoal, Oconee River, Georgia. H. L. Roberts. (100)
 July.
 The Port of Liverpool.* Mark Meredith. (10) July.
 The New York State Barge Canal.* William B. Landreth. (2) July.
 The Atlantic Coastal Project. J. Hampton Moore. (2) July.
 The Regulation of the Wien River at Vienna, Austria.* Kenneth C. Grant. (98)
 July.
 Improvement of Aransas Pass, Texas.* George P. Howell. (100) July.
 Rebuilding Lock Gates, Milan Section of Illinois and Mississippi Canal, During
 Seasons of 1910-1911.* J. C. McElherne. (100) July.
 Surveys and Borings for Lock Location, Ohio River.* Lytle Brown. (100) July.
 The Paris Harbor Project.* (100) July.
 The Brussels Ship Canal.* (From *Technique Moderne*.) (100) July.
 Flow of Streams and the Factors that Modify it. Daniel W. Mead. (Abstract of
Bulletin, Univ. of Wis.) (86) July 12.
 The Coast and Geodetic Survey Tide Predicting Machine No. 2.* E. G. Fischer.
 (13) July 20.
 A Portable Cofferdam.* H. B. McDermid. (13) July 20.
 Protection of Embankments from High Water.* C. F. Green. (15) July 21.
 Freight Piers 39-40-41, East River, N. Y.* (14) July 22.
 Construction of Lackawanna Railroad Pier No. 1, Hoboken.* (14) July 22.
 Coal and Ore Docks of the Baltimore & Ohio at Lorain, Ohio.* (15) July 28.
 Spillway Regulating Gates at Panama. (From *Canal Record*.) (62) July 31.
 Nouveau Système de Protection des Diguees Talus et Côtes par un Revêtement en
 Béton Armé.* J. Robert de Mural. (32) Feb.
 Construction du Phare de la Jument d'Ouessant.* Ribière. (43) Mar.
 La Région de la Loire Maritime son Etat Actuel, son Avenir.* M. F. Godard.
 (32) May.
 Notice sur les Ports de Rotterdam et Amsterdam, leur Voies d'Accès à la Mer et le
 Port d'Ymuiden.* Thouvenot. (43) May.
 Grue Flottante de 60 Tonnes du Port de Mostaganem (Algérie).* P. Caufourier.
 (33) May 13.
 L'Etude des Grandes Force Hydrauliques dans la Région des Alpes.* Paul Lévy-
 Salvador. (33) June 10.
 Die Bewegung des Wassers in Kammerschleusen.* Willibald Liebisch. (53)
 May 5.
 Schwimmkran für zweimal 120 t Last.* Adolf Beran. (48) May 13.
 Durchbrochene Bauformen für Seebauwerke.* Carl Wesemann. (51) June 24.

*Illustrated.

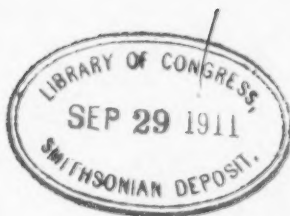


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